

SDMS US EPA REGION V -1

**SOME IMAGES WITHIN THIS
DOCUMENT MAY BE ILLEGIBLE
DUE TO BAD SOURCE
DOCUMENTS.**

Common and scientific names of fish species collected
in the Waukegan-Zion sampling area during 1972

Common Name	Scientific Name
1. Alewife	<u>Alosa pseudoharengus</u>
2. Smelt	<u>Osmerus mordax</u>
3. Bloater	<u>Coregonus hoyi</u>
4. Whitefish	<u>Coregonus clupeaformis</u>
5. Herring	<u>Coregonus artedii</u>
6. Lake Trout	<u>Salvelinus namaycush</u>
7. Brown Trout	<u>Salmo trutta</u>
8. Rainbow Trout	<u>Salmo gairdneri</u>
9. Coho Salmon	<u>Oncorhynchus kisutch</u>
10. Chinook Salmon	<u>Oncorhynchus tshawytscha</u>
11. Longnose Sucker	<u>Catostomus catostomus</u>
12. White Sucker	<u>Catostomus commersoni</u>
13. Carp	<u>Cyprinus carpio</u>
14. Spottail Shiner	<u>Notropis nudsonius</u>
15. Emerald Shiner	<u>Notropis atherinoides</u>
16. Longnose Dace	<u>Rhinichthys cataractae</u>
17. Fathead Minnow	<u>Pimephales promelas</u>
18. Golden Shiner	<u>Notemarginus crysoleucas</u>
19. Central Mudminnow	<u>Umbra lima</u>
20. Gizzard Shad	<u>Dorosoma cepedianum</u>
21. Yellow Perch	<u>Perca flavescens</u>
22. Slimy Sculpin	<u>Cottus cognatus</u>
23. Troutperch	<u>Percaopsis omiscomaycus</u>
24. Ninespine Stickleback	<u>Pungitius pungitius</u>
25. Brook Stickleback	<u>Culaea inconstans</u>
26. Burbot	<u>Lota lota</u>
27. Largemouth Bass	<u>Micropterus salmoides</u>
28. White Crappie	<u>Pomoxis annularis</u>



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST
CHICAGO ILLINOIS 60604

REPLY TO ATTENTION OF

4 MAY 1983

MEMORANDUM

SUBJECT: Recommendation for Remedial Implementation
Alternative Selection - OMC Hazardous Waste Site,
Waukegan, Illinois

FROM: Valdas V. Adamkus
Regional Administrator

TO: Lee M. Thomas
Assistant Administrator
Office of Solid Waste and
Emergency Response

EPA has completed the following remedial CERCLA activities at the Outboard Marine Corporation (OMC) Site located in Waukegan, Illinois.

<u>Activity</u>	<u>Date</u>
Final Work Plan, Source Control Feasibility Study	3/28/83
Source Control Feasibility Study Report	7/15/83
Opening of First Public Comment Period	7/15/83
Public Informational Meeting	7/28/83
Public Meeting	8/3/83
Close of First Public Comment Period	9/1/83
Opening of Second Public Comment Period	3/6/84
Public Informational Meeting	3/14/84
Close of Second Public Comment Period	4/4/84

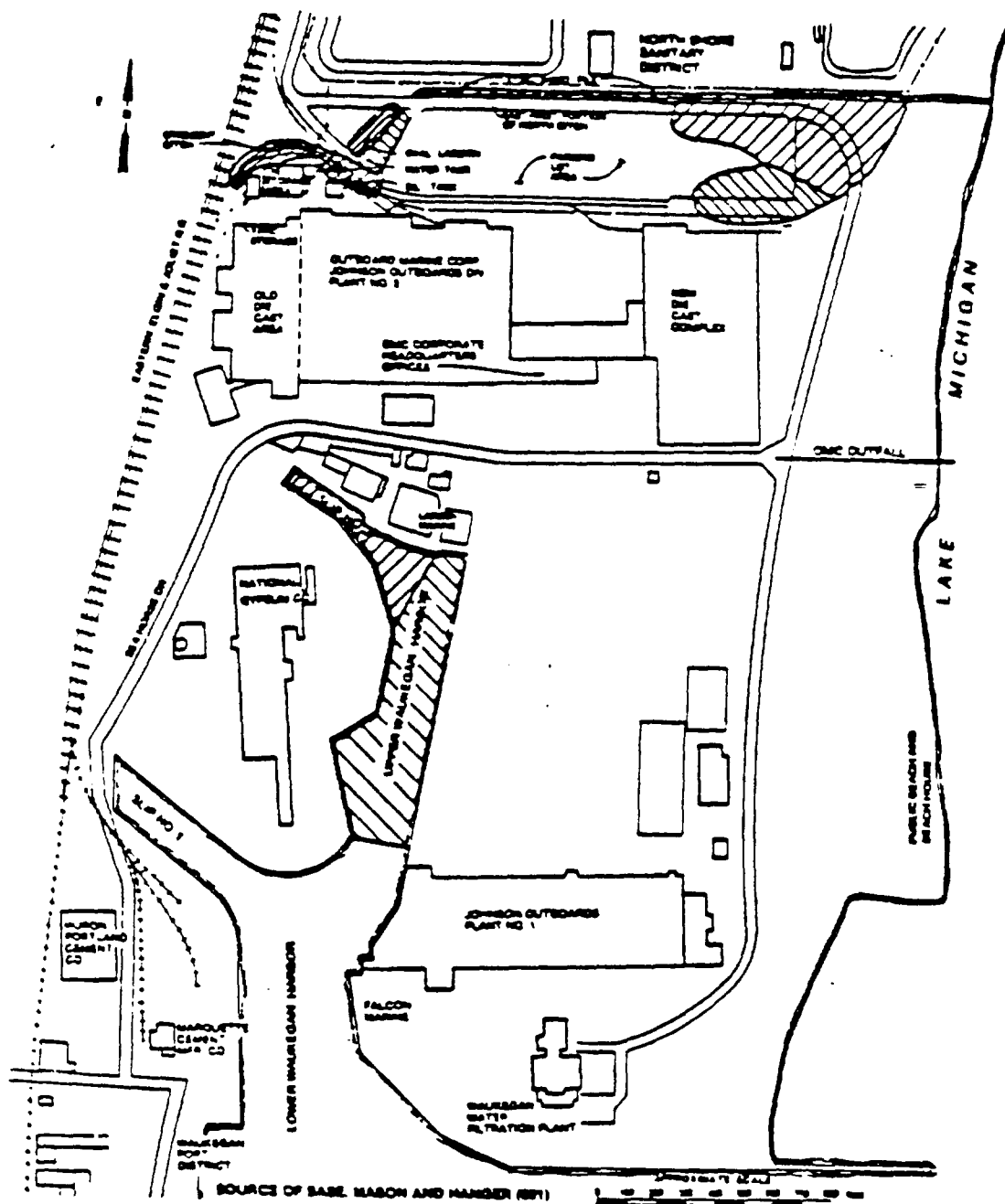
Region V has reviewed the information in the reports and has given careful consideration to the comments received in the public comment periods. Pursuant to Section 104(c)(2) of CERCLA, we have consulted with the State of Illinois before determining the appropriate remedial action. Based on our review, Region V recommends that the following actions at the

OMC Site effectively mitigate and minimize damage to and provide adequate protection of public health, welfare, and the environment. The recommended action includes some off-site transport as such action is more cost-effective than other remedial actions and is necessary to protect public health, welfare, and the environment from the potential risk which may be created by further exposure to the continued presence of PCBs at the OMC Site. As discussed with your staff, the following recommendation includes fund balanced considerations.

<u>Action</u>	<u>Estimated Cost</u>
Dredge, Dewater, Dispose, Cap in Parking Lot (Slip No. 3 and the Upper Harbor)	\$ 9,940,000
Dredge, Remove, Fix and Dispose 5,700 yd ³ of PCB-contaminated material	\$ 3,150,000
Excavate North Ditch, Contain in Crescent Ditch/Oval Lagoon and Cap	\$ 4,210,000
Excavate and Dispose 5,500 yd ³ of PCB-contaminated material (Crescent Ditch/Oval Lagoon)	\$ 740,000
Contain and Cap (Parking Lot)	<u>\$ 3,210,000</u>
TOTAL	\$21,250,000

Operation and maintenance costs for the site are estimated to be \$84,250 annually, or \$800,000 for 30 years on a present worth basis of 10%. The Illinois Environmental Protection Agency will be responsible for the operation and maintenance.

Region V additionally recommends that EPA share in the costs of operation and maintenance for a period of one year following completion of the project. This time frame is needed to allow for settling of the cells and to assure the integrity of the cells.



OUTBOARD MOTOR COMP
JOHNSON OUTBOARDS DIV
PAGE NO. 1

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**ONE CORPORATE
MEMORANDUM**

THE CORPORATE
MANAGEMENT
COUNCIL

11/23/16

ONE OUT ALL

MICHIGAN

PLATE 12. 011 1024 1025

LONG A WALKER (CLAM WALKER)

JOHNSON OUTBOARDS
PLANT NO. 1

FALCON
TRAINING

WILLIAM
WATTS
OF THE CITY OF NEW YORK

THE FIRST FROM FORM

SOURCE OF BASE, ELSON AND MANDER (87)

LEGEND



PCB CONCENTRATIONS
OVER 500 PPM



PCB CONCENTRATIONS BETWEEN
50 AND 500 PPM

**FIGURE 1-2
SITE MAP
OMC HAZARDOUS WASTE SITE
WAUKEGAN, ILLINOIS
EPA ID: 02-0023**

SITE MAP

OMC HAZARDOUS WASTE SITE

WAUKEGAN, ILLINOIS
FBI 12-15-73



Record of Decision
Remedial Alternative Selection

SITE: Outboard Marine Corporation (OMC), Waukegan, Illinois

DOCUMENTS REVIEWED:

I have reviewed the following documents describing the analysis of cost-effectiveness of remedial alternatives for the OMC Site:

- OMC Feasibility Study, CH2M-Hill, July 14, 1983
- OMC Technical Documentation (a staff summary of the information collected during sampling, modeling and engineering studies conducted by Region V as part of the litigation effort)
- Summary of the Remedial Action Alternative Selection
- Responsiveness summary addressing comments received from the public.

DESCRIPTION OF THE SELECTED ALTERNATIVE:

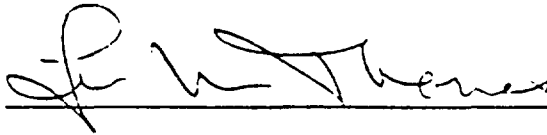
- The alternative selected for each segment of the site is shown on the attached Table 1.

DECLARATIONS:

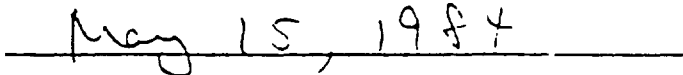
Consistent with CERCLA and the NCP, I have determined that the source control remedy described in Table 1 is the appropriate Fund-financed action for this site in accordance with section 300.68(j) and (k) of the NCP. Although the selected remedy does not meet all the requirements of regulations issued under TSCA and is somewhat less protective than the cost-effective option as defined by the NCP, the remedy is expected to be reasonably effective in preventing the migration of PCB from the site which would threaten public health, welfare or the environment. In addition, this remedy is expected to be significantly less expensive than any alternative which would be fully consistent with TSCA regulations and protective of public health. Therefore, I have determined that the level of protection provided by the selected remedy is appropriate considering the need for additional protection at this site and the amount of money available in the Fund to respond to other sites which present or may present a threat to public health, welfare or the environment.

The State of Illinois has been consulted and agrees with the remedy. The action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period of one year. In accordance with section 104(c)(3), the State is required to ensure the continued operation and maintenance of the selected remedy.

In addition, the offsite transport and secure disposition of the highly contaminated material (see Table 1) is more cost effective than other remedial action and is necessary to protect public health, welfare or the environment.



Lee M. Thomas
Assistant Administrator
Office of Solid Waste and Emergency Response



Date



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

SUMMARY OF DECISION
OMC HAZARDOUS WASTE SITE
WAUKEGAN HARBOR, ILLINOIS

The five actions described below are the U.S. Environmental Protection Agency's (U.S. EPA) plan for cleanup of PCB contamination at the OMC Hazardous Waste Site in Waukegan Harbor, Illinois. These actions are consistent with the National Oil and Hazardous Substances Contingency Plan of Superfund, which requires that a chosen cleanup alternative be technologically feasible, protects human health and the environment, and considers the need to balance funds under the Superfund program. This chosen plan will also ensure that Waukegan Harbor will retain its current use.

Specific actions include:

1. SLIP NO. 3 and UPPER HARBOR: REMOVE HOT SPOTS AND DISPOSE OFFSITE

All materials with PCB concentrations greater than 10,000 parts per million (ppm) will be dredged from localized areas near the former OMC outfall (drainage pipe) and the western portion of Slip No. 3. Dredging will be performed within a temporary cofferdam to reduce the dispersal of PCB sediments outside the work area. Water removed during the dredging process will be routed to a water treatment plant, treated down to 1 part per billion (ppb) or less PCBs, and discharged to the harbor or to a sanitary sewer. The dredged solids will be transported to the batch plant for fixation (a chemical process that prevents the release of water from the dredged material), then taken to curing cells and solidified into a non-flowable state. The fixed solids will be disposed of in an offsite licensed chemical waste landfill.

This action will remove and dispose of offsite about 92 percent (286,500 lbs.) of all the PCBs now found in Slip No. 3 and the Upper Harbor. The estimated cost is \$3,150,000.

2. SLIP NO. 3 AND UPPER HARBOR: DREDGE, DEWATER, AND DISPOSE IN PARKING LOT

A sediment dispersal device will be installed at the southern end of the Upper Harbor. A clay-lined dewatering lagoon will be constructed on the OMC vacant foundry property (immediately east of the Upper Harbor). Sediments with PCB concentrations greater than 50 ppm will be removed from the slip and Upper Harbor by hydraulic dredging and pumped to the dewatering lagoon. Sediments will be treated in two ways:

- o Sediments from the central portion of Slip No. 3 with PCB concentrations greater than 1,000 ppm will be pumped to Area 1 of the lagoon. Vaporization of PCBs will be controlled during dewatering by covering the filled lagoon

surface with organic sludge. Solids will be removed from the lagoon surface with organic sludge. Solids will be removed from the lagoon about 2 months after the dredging is completed. They will be fixed at the batch plant, then solidified in the curing cells.

- o Sediments from the Upper Harbor with PCB concentrations between 50 and 1,000 ppm will be pumped to Area 2 of the dewatering lagoon. The top layer of solids will be dried by evaporation, then removed. This process will be repeated about 6 times over a 2-year period to remove all solids.

Water removed during the dredging and dewatering processes will be treated down to 1 ppm or less PCBs before discharge to the harbor or a sanitary sewer. The dewatered and fixed solids will be transported by truck to the Parking Lot Area, where they will be codisposed with the existing contamination in a containment cell in the OMC Parking Lot.

This action will remove about 7 percent (23,700 lbs.) of all the PCBs now found in Slip No. 3 and the Upper Harbor, and dispose of them in a cell in the OMC Parking Lot Area. The estimated cost is \$9,940,000.

3. NORTH DITCH AREA: REMOVE HOT SPOTS AND DISPOSE OFFSITE

The most highly contaminated soil will be excavated from localized areas of the Crescent Ditch and Oval Lagoon. This material contains about 89 percent (440,500 lbs.) of all the PCBs now found in the North Ditch Area and about 57 percent of all the PCBs now found in the North Ditch and Parking Lot Areas. The soil will be disposed of in an offsite licensed chemical waste landfill. The estimated cost is \$740,000.

4. PARKING LOT: CONTAIN AND CAP

Approximately 277,700 lbs. of PCBs occur in the Parking Lot Area. The dredged solids from Slip No. 3 and the Upper Harbor and other contaminated materials (such as liner material from the lagoon and the curing cells) will be brought to the site, graded, and compacted. All the contaminated material will be contained with slurry walls, capped with impermeable clay, and overlaid with a pavement cover. The height of the Parking Lot Area containment will be about 14 feet higher than the existing elevation. The estimated cost is \$3,210,000.

5. NORTH DITCH AREA: CONTAIN AND CAP

PCB-contaminated soil will be contained and capped in the Crescent Ditch/Oval Lagoon area. The east-west portion of the North Ditch will be partly excavated to install a bypass drainage pipeline that will flow into Lake Michigan. The PCB-contaminated soil from the

bypass excavation will be placed in the Crescent Ditch/Oval Lagoon under the cap before the area is capped. About 10 percent (51,600 lbs.) of all the PCBs now found in the North Ditch area will remain in the containment area. The estimated cost is \$4,210,000.

The project will be paid by Superfund at a total estimated cost of \$21,250,000. The engineering design for this plan is expected to be completed this winter by the U.S. Army Corps of Engineers. The schedule for construction will be developed at that time.

A Responsiveness Summary to public comments will be available Monday, May 21, 1984, at established information repositories:

Waukegan Public Library
128 N. County Street

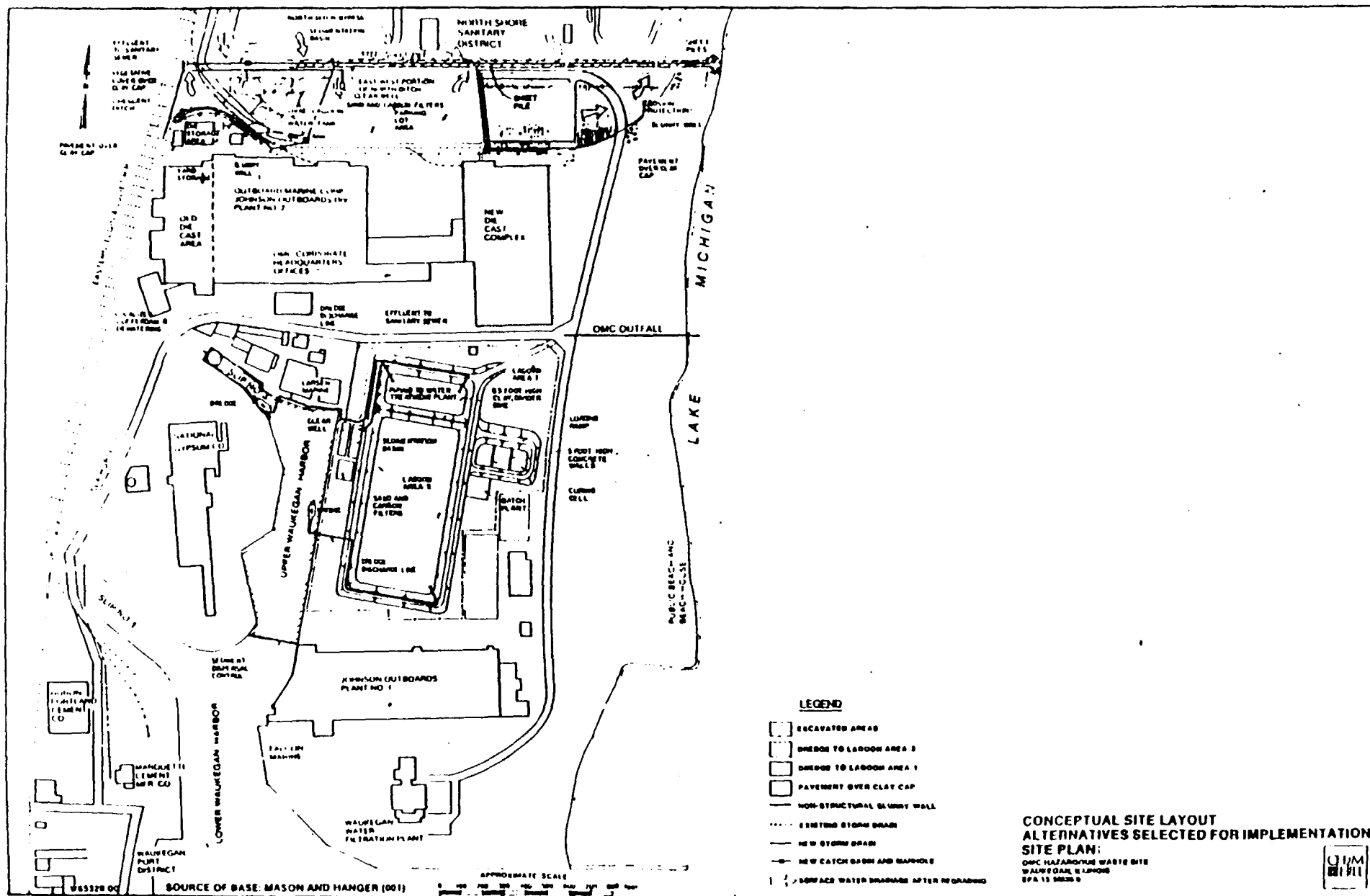
Waukegan City Hall
106 N. Utica Street

U.S. EPA Library, 14th Floor
230 South Dearborn Street
Chicago, Illinois

Copies may also be obtained by writing:

Vanessa Musgrave
U.S. EPA
230 South Dearborn Street
Chicago, Illinois 60604

The Record of Decision will be available after printing. Copies for public viewing will be available at the above information repositories. Requests for individual copies of the document, including supporting technical information, should be sent to U.S. EPA at the above address.



Summary of Remedial Alternative
Selection - OMC Hazardous Waste Site,
Waukegan, Illinois

I. Site Location and Description

The Outboard Marine Corporation site (OMC) is located near the intersection of Grand Avenue and Sheridan Road on the west shore of Lake Michigan in Waukegan, Illinois, about 37 miles north of Chicago and 10 miles south of the Wisconsin state border. See diagram on next page.

Waukegan Harbor is an irregularly shaped harbor about 37 acres in area. The two areas of concern are Slip No. 3 and the Upper Harbor. PCB concentrations in Slip No. 3 are greater than 500 parts per million (ppm). In the Upper Harbor, PCB concentrations are between 50 and 500 ppm. Water depths in the harbor generally vary from 14 to 25 feet with some shallower depths in Slip No. 3. The harbor sediments consist of 1 to 7 feet of very soft organic silt (muck) overlying typically 4 feet of medium dense, fine to coarse sand. A very stiff silt (glacial till) that typically ranges from 50 to more than 100 feet thick underlies the sand. The entire harbor is bordered by 20- to 25-ft-long steel sheet piling, except at the Waukegan Port District boat launching areas and at the retaining wall near the harbor mouth. The sheet piles generally extend into the sand layer above the glacial till.

The North Ditch is a small tributary of Lake Michigan that drains surface runoff from about 0.11 square miles of OMC and North Shore Sanitary District property. The ditch also drains surface runoff from an area west of OMC property and the railroad tracks. The North Ditch includes the 600-ft-long, 20-ft-wide Crescent Ditch; the 240-ft-long, 10- to 20-ft-40-ft-wide Oval Lagoon; and a 2,000-ft-long, 10-to 20-ft-wide east-west portion of the North Ditch. PCB concentrations are between 50 and 5,000 ppm in the North Ditch/Crescent Ditch/Oval Lagoon area. The U.S. Department of the Interior measured the mean daily discharge of the ditch between March and September 1979 as 1.8 cubic feet per second (cfs), with a maximum discharge of 5.3 cfs. They calculated the 5-year storm event to be 23 cfs.

The Parking Lot area is located north of OMC's Plant No. 2 and is about 9 acres in area. PCB concentrations are between 50 to 5,000 ppm. There are three entrances to the Parking Lot area: two fenced entrances in the northwest corner of OMC's property and one fenced entrance southeast of OMC's new die-cast complex at the intersection of OMC's private road and Seahorse Drive.

The generalized subsurface conditions in the North Ditch/Parking Lot area consist of typically 30 feet of compact, very fine to fine sand overlying a stiff to very stiff silt (glacial till). The thickness of the glacial till typically ranges from 50 to more than 100 feet.

The presence of high levels of PCBs in soil and harbor sediments in the vicinity of the OMC plant was discovered in 1976. In Slip No. 3, approximately 10,900 yd³ of material are contaminated by PCBs (exceeding 50 ppm). Available data indicates that approximately 305,200 lb of PCBs exist in the contaminated slip. Currently no barriers exist to retard migration of the materials into the Upper Harbor and potentially Lake Michigan. This is exasperated by continual boat traffic in the harbor. Approximately 35,700 yd³ of muck in the Upper Harbor are contaminated by about 5,000 lb of PCBs (exceeding 50 ppm). See Exhibit C pg 1-6. In the North Ditch/Parking Lot area, approximately 175,800 yd³ of material are contaminated by PCBs (exceeding 50 ppm). Currently available information indicates that approximately 771,200 lbs of PCBs exist in this contaminated area. See Exhibit C pg 1-6. Currently no barriers exist to retard migration of the substances into the environment.

It is currently estimated that 7 to 20 lb of PCBs are discharged annually into Lake Michigan from the North Ditch. The groundwater is within 3 feet of the surface of the Parking Lot area, resulting in contamination of this water. It is estimated that the slowly moving water will begin releasing some 8 lb/day of PCBs into Lake Michigan in approximately 60 years. Existing air contamination from the North Ditch waters is estimated at 15 lb/yr. Any additional movement of the soil, currently under the paved parking lot, could cause additional volatilization of PCBs. See Exhibit C pg 6-16. Approximately 98.4 percent of the PCBs now found in the Slip/Harbor area are located in Slip No. 3, 1.6 percent have migrated into the Upper Harbor. See Exhibit C, pg 8-9.

Site History

Discharges of process water cooling water, and water from floor drains, from OMC are the major source of PCB contamination to the area. About 9 million pounds of PCB's were purchased from the Monsanto Company from the early 1950's to 1971. These PCB's were used as hydraulic fluids in die casting machines and related equipment.

Because the hydraulic systems in which the hydraulic fluids were used leaked routinely, the fluids containing PCB's escaped from die-cast machinery onto the surrounding floor area. OMC has advised U.S. EPA that 10 to 15 percent of all PCB's purchased may have escaped through floor drains and an oil interceptor system. The floor drains discharge to Waukegan Harbor and the North Ditch Drainage. U.S. EPA has estimated that the discharge could have been as high as 20%.

Release of PCB's from the site is from Surface Water, Volatilization, Groundwater, and the Food Chain. Possible receptors include the biological community of the harbor, North Ditch, and Nearshore Lake Michigan Area. People are exposed or potentially exposed through fish consumption, potentially through the drinking water supply, and by direct contact.

The official 1980 Census figure for the City of Waukegan is 67,653. The Harbor area, however, is zoned for industrial use. Fifteen businesses are located in the immediate Harbor area and provide jobs to approximately 3,500. The local Port Harbor for primarily recreational use. Long term plans additionally include a development of the Upper Harbor. See Exhibit C pgs 6-12, 6-13.

The population is exposed to PCB through three medias; air, water, and the food chain (primarily fish). It is currently estimated that 22 lb of PCBs are released into Lake Michigan each year from Waukegan Harbor water (based on a steady state model). Approximately 12 to 40 lb of PCBs are released from the Harbor into the local airshed each year. Existing air contamination from the North Ditch waters is estimated at 15 lb/yr. See Exhibit C pgs 6-16 through 6-17. Total PCB concentrations vary from 0.6 parts per billion (ppb) in Waukegan Harbor to less than 0.01 ppb in Lake Michigan directly offshore from Waukegan Harbor. There is an emergency water supply intake for Waukegan near the mouth of the harbor, although it is rarely utilized. See Exhibit C pg 6-20. In U.S. EPA studies on Lake Michigan fish, results ranged from concentrations of 2.7 ppm to 187 ppm PCB in fatty tissue for all species.

Enforcement

U.S. EPA filed suit against the OMC and Monsanto Companies in 1976. The suit is still in effect, not being brought to trial. The existing suits may be dismissed and reinstated as a Superfund Cost Recovery Action following implementation of the cleanup. U.S. EPA has conducted several years of negotiations with OMC to try and reach an agreement regarding a cleanup plan. Since no agreement could be reached over a long period of time, Region V recommended to Headquarters that the Fund be accessed for the cleanup.

Alternatives Evaluation

The feasibility study began with an evaluation of over 70 unit processes or methods to determine their potential for contributing to PCB removal. The processes retained from preliminary screening were assembled into 21 alternatives. Finally 17 alternatives and two subalternatives were selected for more detailed evaluation. Final alternative selection was based upon the Feasibility Study, input from the community relations program, and input from various headquarter's offices.

Community Relations

Prior to the selection of the appropriate remedial action at the OMC site the following actions were taken and the documents identified were reviewed by the Regional staff:

A. On March 28, 1983, a Final Work Plan, Source Control Feasibility Study, OMC site, Waukegan, Illinois was authorized. U.S. EPA Work Authorization 13-5M28.0.

B. On July 14, 1983, a Source Control Feasibility Study, OMC Hazardous Waste Site, Waukegan, Illinois (FS) was completed.

C. On July 15, 1983, a public comment period to evaluate and comment on the FS began. A public informational meeting was held in Waukegan on July 28, 1983, to respond to any questions by the public. On August 3, 1983, a public meeting was held in Waukegan to receive formal public comment on the FS. Finally, on September 1, 1983, the extended public comment period was closed.

D. Twenty-five written comments in addition to the comments received during the public hearing were received and responded to by the Region.

E. On March 6, 1984, a second public comment period to evaluate and comment on two issues in addition to the FS began. A public informational meeting was held in Waukegan on March 14, 1984, to respond to any questions by the public. On April 4, 1984, the public comment period closed.

F. Over 250 public comments were received during the public comment period and responded to by the Region.

G. As affected Agencies, the Illinois Environmental Protection Agency and the U.S. Corp of Engineers were informed of and involved in the preparation of the FS. Additionally, pursuant to 16 U.S.C. 662(a), the U.S. fish and Wildlife Service, Department of Interior was informed about the FS. No adverse comments were received by U.S. EPA from these Agencies.

Consistency with other Environmental Laws

U.S. EPA conducted the feasibility study process in accordance with the National Contingency Plan, and to the greatest extent possible, in compliance with the National Environmental Policy Act. U.S. EPA developed a cost effective alternative which is consistent with other environmental laws applicable to the site. Since a Fund-Balanced alternative is under review a Superfund waiver from TSCA requirements may be needed.

Recommended Alternative

In accordance with Part 300.68(J) U.S. EPA conducted a complete cost effective analysis concerning a wide range of alternatives. The alternative presented below also contains fund balancing considerations.

Slip No. 3 and Upper Harbor: Hot Spot Removal

PCB-contaminated sediment, sand and silt would be dredged from the localized area near the former OMC outfall (drainage pipe). This material contains the greatest PCB concentrations in the harbor and represents 92 percent of all the PCBs now found in Slip No. 3 and the Upper Harbor. This alternative would remove, fix, and dispose of offsite an estimated 5,700 yd³ of PCB contaminated material, containing about 286,500 lb of PCBs. The material would be disposed of in an off-site licensed chemical waste landfill. The estimated cost for this alternative is \$3,150,000.

Slip #3 and Upper Harbor: Dredge, Dewater, and Dispose in Parking Lot

A sediment dispersal control device would be installed at the southern end of the Upper Harbor. A clay-lined dewatering lagoon will be constructed on the OMC vacant foundary property. Sediments in excess of 50 ppm PCB will be removed from the harbor by hydraulic dredging. Sediment slurry will be pumped to the dewatering lagoon. Supernatant would be decanted, treated to 1 ppb PCB's and returned to the harbor.

Solids would be treated in two fashions

1) Highly contaminated material from slip:

dredge —> initial dewatering —> fixation

2) Less contaminated material from the harbor:

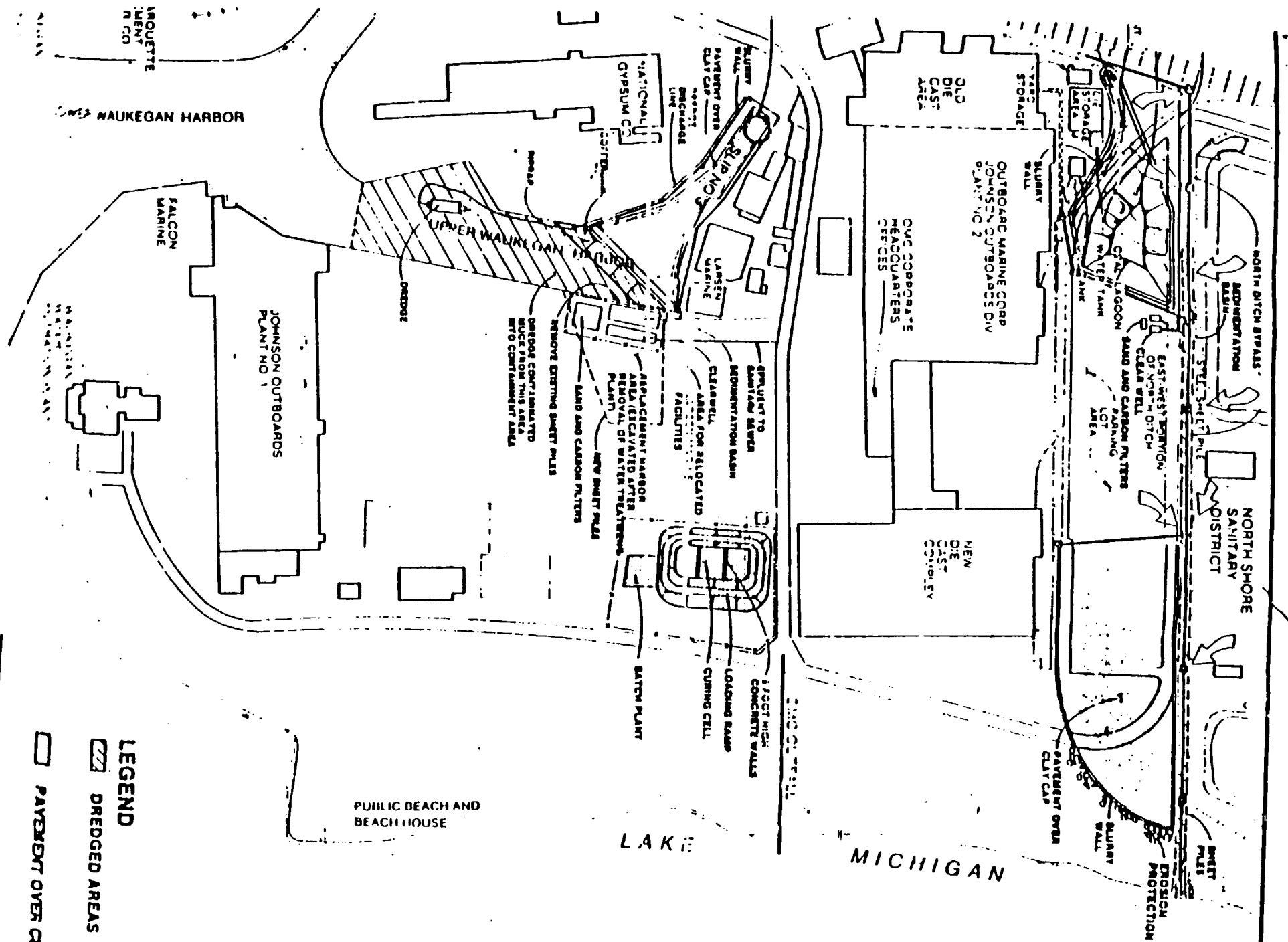
dredge — initial dewatering —> mechanical dewatering

Solids will be periodically removed by dragline and hauled by truck for disposal in the parking lot. This will be codisposed with the existing contamination in the parking lot.

Approximately 46,600 yd³ of sediments containing about 24,700 lbs of PCB's would be removed from the harbor, dewatered, and disposed in the parking lot. Contaminated lagoon material would also be brought to the parking lot. This alternative is estimated to cost \$9,940,000.

DOCUMENTS SUBMITTED IN CONJUNCTION WITH
RECOMMENDATION FOR REMEDIAL IMPLEMENTATION
ALTERNATIVE SELECTION - OMC HAZARDOUS WASTE SITE
WAUKEGAN, ILLINOIS

1. Summary of Written Public Comments on the Source Control Feasibility Study on the OMC Site (July 15 through September 1, 1983).
2. Summary of Comments OMC Public Meeting August 3, 1983.
3. Breakdown of Public Comments Received during March - April 1984 Public Comment Period on OMC.
4. Application for Approval of an Alternate Disposal Method to be used for Dredge Materials that Contain PCBs at the OMC - Waukegan Harbor Hazardous Waste Site.
5. PCB Landfill, Waukegan Illinois.
6. U.S. Department of Interior letter dated December 14, 1983.
7. Department of the Army letter dated August 15, 1983.
8. U.S. Corp of Engineers memorandum for record re: Chemical Test on Geotechnical Samples at OMC.
9. CH2M Hill letters dated: May 6, 1983, May 24, 1983, June 22, 1983, October 31, 1983, November 21, 1983, March 13, 1984, April 4, 1984, April 6, 1984, April 10, 1984, and April 17, 1984.



<u>Schedule</u>	<u>Date of Implementation</u>
Key Milestones	(after ROD signature)
Complete Enforcement Negotiations	30 days
Aware/AG for Design Coord.	Completed
Superfund State Contract	45 days
Award IAG to initiate design	40 days
Start Design	45 days
Complete Design	6 months
Award Cooperative Agreement for Construction	8 months
Award Superfund State Contract for Construction	8 months
Start Construction	10 months
Complete Construction	3.5 years

Future Actions

Following construction, U.S. EPA will be responsible for O&M for one year. At that point long term O&M will revert to State responsibility.

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I. BACKGROUND

A. Site Description

The Outboard Marine Corporation site (OMC) is located near the intersection of Grand Avenue and Sheridan Road on the west shore of Lake Michigan in Waukegan, Illinois, about 37 miles north of Chicago and 10 miles south of the Wisconsin state border. The site may be divided into three areas; Waukegan Harbor, the North Ditch and the OMC parking lot. See Figure 1.

Waukegan Harbor is an irregularly shaped harbor about 37 acres in area. The two areas of of the Harbor of concern to this project are Slip No. 3 and the Upper Harbor. Water depths in the harbor generally vary from 14 to 25 feet with some shallower depths in Slip No. 3. The harbor sediments consists of 1 to 7 feet of very soft organic silt (muck) overlying typically 4 feet of medium dense, fine to coarse sand. A very stiff silt (glacial till) that typically ranges from 50 to more than 100 feet thick underlies the sand. The entire harbor is bordered by 20- to 25-ft-long steel sheet piling, except at the Waukegan Port District boat launching areas and at the retaining wall near the harbor mouth. The sheet piles generally extend into the sand layer above the glacial till.

The North Ditch is a small tributary of Lake Michigan that drains surface runoff from about 0.11 square miles of OMC and North Shore Sanitary District property. The ditch also drains surface runoff from an area west of OMC property and the railroad tracks. The North Ditch includes the 600-ft-long, 20-ft-wide Crescent Ditch; the 240-ft-long, 10- to 40-ft-wide 2 Oval Lagoon; and a 2,000-ft-long, 10-to 20-ft-wide east-west portion of the North Ditch. The U.S. Department of the Interior measured the mean daily discharge of the ditch between March and September 1979 as 1.8 cubic feet per second (cfs), with a maximum discharge of 5.3 cfs. They calculated the 5-year storm event to be 23 cfs.

The Parking Lot area is located north of OMC's Plant No. 2 and is about 9 acres in area. There are three entrances to the Parking Lot area: two fenced entrances in the northwest corner of OMC's property and one fenced entrance southeast of OMC's new die-cast complex at the intersection of OMC's private road and Seahorse Drive.

The generalized subsurface conditions in the North Ditch/Parking Lot area consist of typically 30 feet of compact, very fine to fine sand overlying a stiff to very stiff silt (glacial till). The thickness of the glacial till typically ranges from 50 to more than 100 feet.

B. EPA Work at the OMC Site.

High levels of PCBs in soil and harbor sediments in the vicinity of the OMC plant were discovered in 1976 and were found to have originated in the OMC outfalls. With this discovery, EPA and State of Illinois began a series of attempts to force OMC to cease discharging PCB and remove the PCB contaminated sediments from Waukegan Harbor and the North Ditch area. These attempts culminated in a suit filed against OMC by EPA to force OMC to dispose of North Ditch soils and dredge/dispose of contaminated Harbor sediments and a countersuit by OMC against EPA. As a result of these 3 suits, EPA conducted a series of studies to assess the nature and extent of environmental problems in air, surface water, ground water, soils and sediments of Waukegan Harbor and North Ditch areas and southern Lake Michigan.

These studies included sampling studies:

An Engineering Study for the Removal and Disposition of PCB Contamination in the Waukegan Harbor and North Ditch at Waukegan Harbor, Addendum to Final Report. Prepared for USEPA Region V, Chicago, Illinois. Lexington, Kentucky: Mason & Hanger--Silas Mason Co., Inc., May 1981.

Hydrogeologic Investigation, Outboard Marine Corporation, Waukegan, Illinois. Prepared for USEPA Region V and JRB and Associates. Madison, Wisconsin: Warzyn Engineering, Inc., September 20, 1979.

OMC Technical and Witnessing Case Support Hydrological Study of Ground Water, Final Report. Prepared for USEPA Office of Water Enforcement, Washington, D.C. McLean, Virginia: JRB Associates, Inc. February 10, 1981.

Sediment and Shore Sample Collection, Waukegan Harbor Slip #3. Prepared for USEPA Region V, Chicago, Illinois, and Mason & Hanger--Silas Mason Co., Inc. Madison, Wisconsin: Warzyn Engineering, Inc., May 26, 1981.

Karnauskas, Robert J. Subsurface Investigation, North Ditch Area Outboard Marine Corporation, Waukegan, Illinois. Prepared for USEPA Region V, Chicago, Illinois. Madison, Wisconsin: Warzyn Engineering, Inc. July 29, 1980.

Outboard Marine Corporation, Waukegan Harbor Boring, Waukegan, Illinois--C 9791. Prepared for Mason & Hanger--Silas Mason Company, Inc., and USEPA Region V, Chicago, Illinois. Madison, Wisconsin: Warzyn Engineering, Inc. August 5, 1980.

Sand Sample Collection, Waukegan Harbor Slip No. 3, Waukegan, Illinois--C 9560. Prepared for Mason & Hanger--Silas Mason Company, Inc., and USEPA Region V, Chicago, Illinois. Madison, Wisconsin: Warzyn Engineering, Inc., January 6, 1981.

Sediment and Shore Sample Collection, Waukegan Harbor Slip No. 3, Waukegan, Illinois--C 9729. Prepared for Mason & Hanger--Silas Mason Company, Inc., and USEPA Region V, Chicago, Illinois. Madison, Wisconsin: Warzyn Engineering, Inc., May 26, 1981.

Mathematical Modelling Studies:

Thomann, R.V., and M.T. Kontaxis. Mathematical Modeling Estimate of Environmental Exposure Due to PCB-Contaminated Harbor Sediments of Waukegan Harbor and North Ditch. Prepared for USEPA, Cincinnati, Ohio. Mahwah, New Jersey: HydroQual, Inc., February 1981.

Thomann, R.V., and M.T. Kontaxis. Mathematical-Modeling Estimate of Environmental Exposure Due to PCB-Contaminated Harbor Sediments of Waukegan Harbor and North Ditch. Prepared for USEPA, Cincinnati, Ohio, Mahwah, New Jersey: HydroQual, Inc., February 1981.

An Estimate of Sediment Movement in North Ditch, Waukegan, Illinois. Prepared for USEPA Region V, Chicago, Illinois. Champaign, Illinois: United States Department of the Interior, Geological Survey. 1980.

Roberts, S.A. Waukegan Harbor Slip No. 3--PCB Loading Rates. Prepared for USEPA Region V, Chicago, Illinois. White Plains, New York: Malcolm Pirnie. July 21, 1982.

Volatilization. Prepared for USEPA Region V, Chicago, Illinois. White Plains, New York: Malcolm Pirnie., August 5, 1982.

Biological Studies:

Harris, Rosalind Mason. Waukegan Harbor PCB Fish Levels. Prepared for USEPA Region V, Chicago, Illinois. White Plains, New York: Malcolm Pirnie, July 9, 1982.

- Study titled, "Outboard Marine Corporation Biological Studies Report, "February, 1979, prepared by USEPA, Region V, Central Regional Laboratory. (This report is not a public document).
- Study titled, "Effects of PCB's on Plankton," September 8, 1981, prepared by Donald C. McNaught.
- Study titled, "Health Risks Posed to Consumers of Fish Contaminated with PCB's from Lake Michigan," February, 1981, prepared by Clement Associates.

Engineering Studies:

An Engineering Study for the Removal and Disposition of PCB Contamination in the Waukegan Harbor and North Ditch at Waukegan, Illinois, Final Report. Prepared for USEPA Region V, Chicago, Illinois. Lexington, Kentucky: Mason & Hanger--Silas Mason Co., Inc., January 1981.

An Engineering Study for the Removal and Disposition of PCB Contamination in the Waukegan Harbor, and North Ditch at Waukegan, Illinois. Prepared for USEPA Region V, Chicago, Illinois. Lexington, Kentucky: Mason & Hanger --Silas Mason Co., Inc., January 1981.

Volatilization of PCBs During Planned Waukegan Harbor Cleanup Operations, Literature Review. Prepared for USEPA Region V, Chicago, Illinois. Lexington, Kentucky: Mason & Hanger--Silas Mason Co., Inc., May 1981.

An Engineering Study for the Removal and Disposition of PCB Contamination in the Waukegan Harbor and North Ditch at Waukegan, Illinois. Prepared for USEPA Region V, Chicago, Illinois. Lexington, Kentucky: Mason & Hanger --Silas Mason Co., Inc., January 1981.

The numerous investigations conducted over the years allowed EPA to accurately define the site in terms of the extent and quantity of contamination. The studies show that the OMC site is the largest uncontrolled potential source of PCB to Lake Michigan. More than one million pounds of PCB are present on site. The PCB is shown to be bioaccumulating in the fish in Waukegan Harbor and Lake Michigan. The modeling studies demonstrate that the PCB is leaving the site through movement of the surface water and ground water, volatilization to the air and transport of the sediment.

C. Concentrations of PCB Found in the Sediment:

Sampling data from Slip #3 showed PCB in concentrations up to 520,000 parts per million (ppm). It is estimated that more than 300,000 pounds of PCB are contaminating 10,000 cubic yards of sediment in Slip #3. Data from the upper harbor areas of Waukegan Harbor also showed PCB contamination. It is estimated that approximately 5,000 lbs of PCB are present in 35,700 cubic yards of sediment in the upper harbor. The concentrations found in these sediments are much smaller than those found in the sediments of Slip 3; the highest concentration is 500 ppm PCB. Figure 2 shows the average concentration of PCB found in the various segments of Slip #3 and Waukegan Harbor.

North of the OMC plant, the North Ditch area contains sediments with concentrations of PCB exceeding 35,000 ppm. It is estimated that 495,000 pounds of PCB are present in 70,800 cubic yards

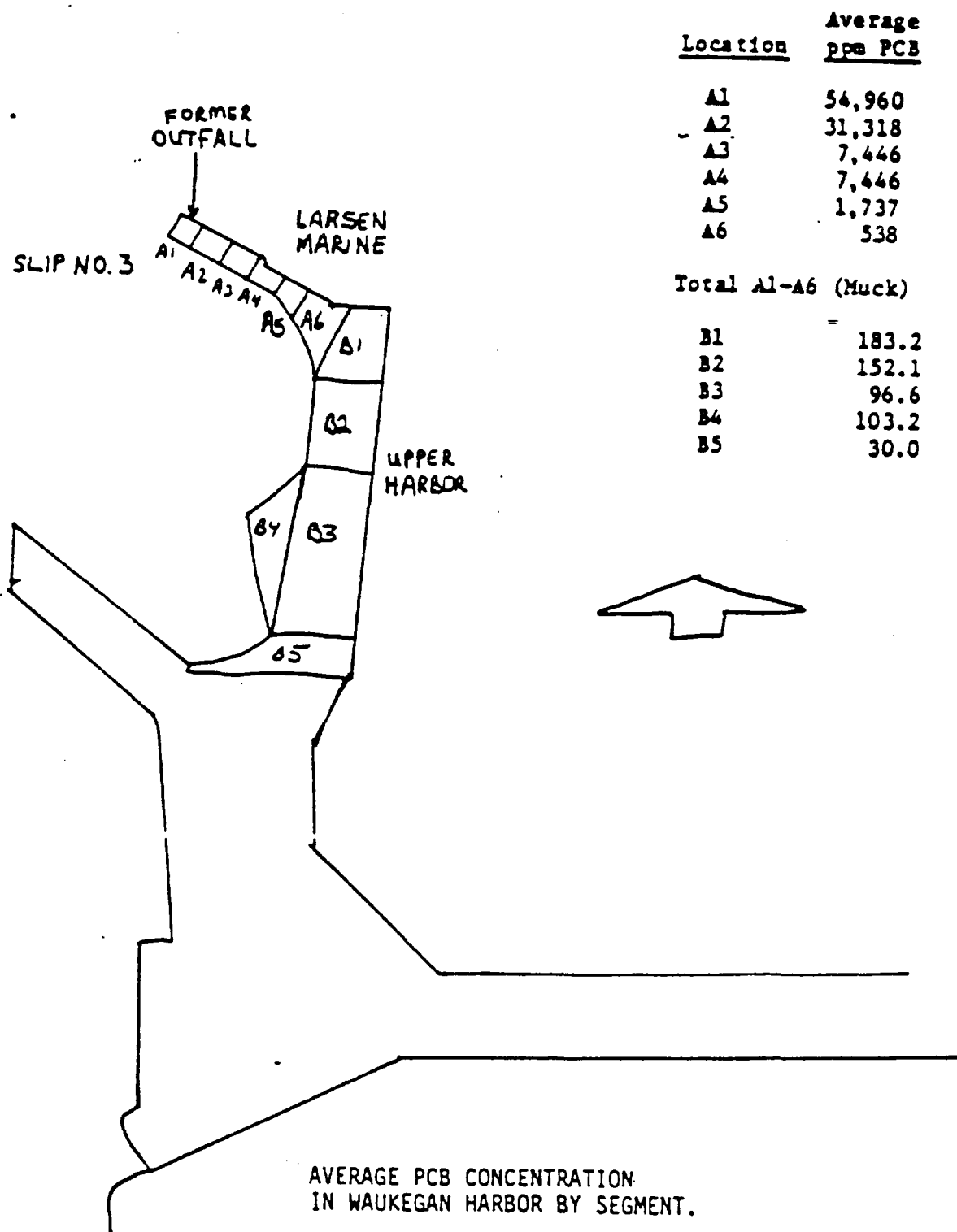
of sediment and soils in the North Ditch area. Finally, the area of the OMC parking lot contains approximately 277,700 pounds of PCB in 105,800 cubic yards of soil. The concentrations found in this soil range up to 5,000 ppm. Figure 3 shows the areas north of the OMC plant with concentrations of PCB greater than 50 ppm.

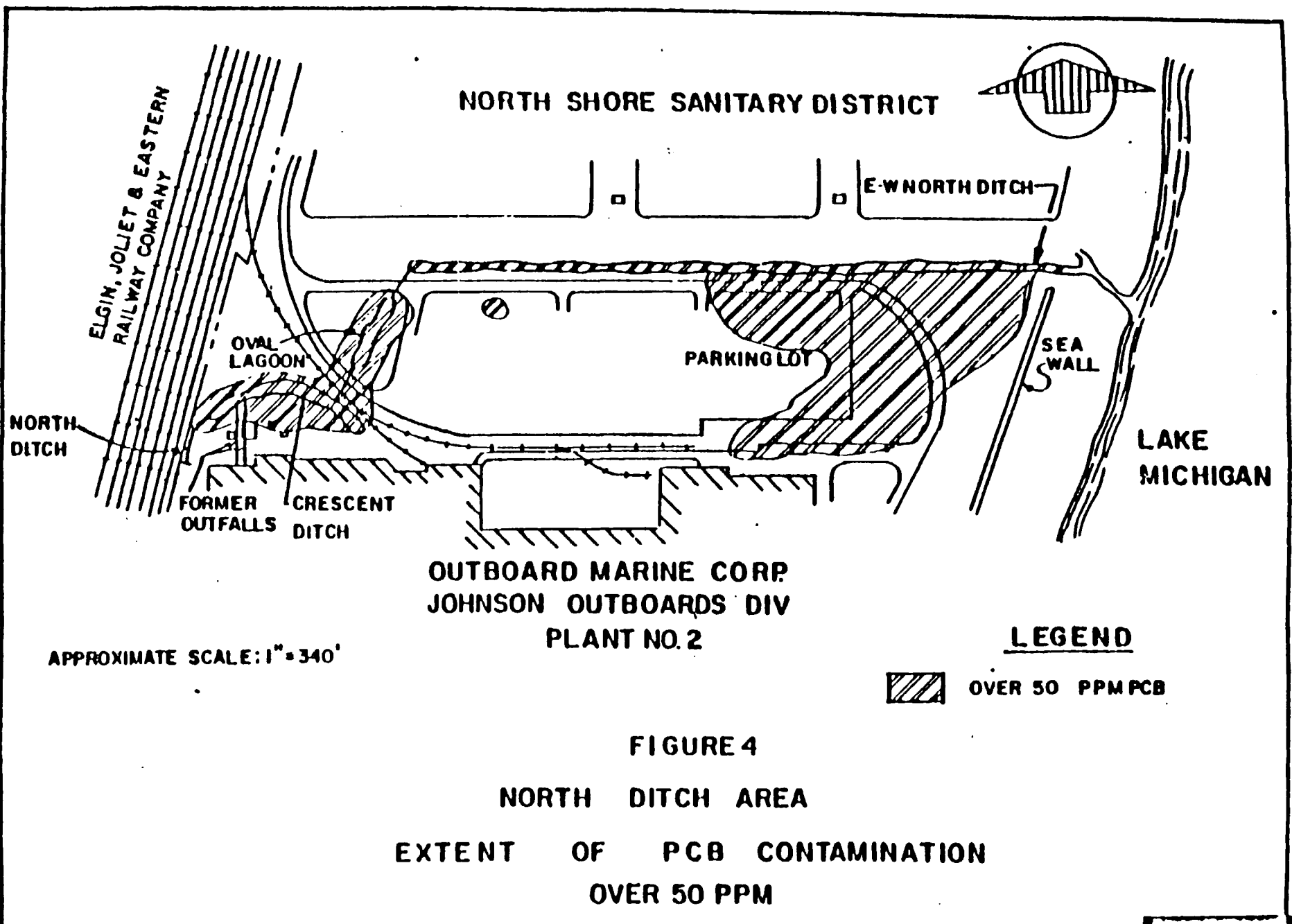
D. Mechanisms for PCB Release from OMC:

The sampling and modeling studies showed that PCB's are being released from the OMC site to the surrounding environment. Lake Michigan is the ultimate receptacle for most of the PCBs. The mechanisms by which the PCBs are being released include the air, through volatilization of the pollutant; the surface water, through the flushing of Waukegan Harbor and runoff through the North Ditch; the ground water, through the slow movement of the ground water towards Lake Michigan; and the sediment transport, through the movement of sediment with surface and ground water. The rates of release of PCB through each of these mechanisms were explored in the investigations conducted by EPA.

1. Air

Although no air monitoring for the presence of PCB's was conducted at the site, modeling was used to estimate rates of volatilization of PCB from OMC. The concentration of PCB expected in solution at the sediment/water interface was estimated by





mixing contaminated sediment in water, decanting the mixture and analyzing for the PCB concentration of the water. This concentration was used with transport rate equations to estimate the rate of volatilization from the site. A volatilization rate of $3.8 \text{ mg/m}^2 / \text{hr}$ from a saturated solution (based on experiments conducted by General Electric in New York) was assumed. If volatilization is considered proportional to the concentration of PCB in solution, calculations based on the volatilization rate and the area of the site show that approximately 3.3 pounds of PCB per month are leaving the harbor portion of the OMC site through the atmosphere. Because that rate would vary positively with temperature, EPA estimates a total of 12 to 40 pounds per year of PCB are volatilizing from the harbor. In addition, it is estimated that the North Ditch contributes 15 pounds of PCB to the atmosphere per year.

2. Water & Sediment:

A great deal of monitoring was conducted to determine the concentrations of PCB found in the water column and sediments of both the harbor and the North Ditch. In Waukegan Harbor, concentrations in the water column ranged from a mean of approximately 6 parts per billion (ppb) about 300 feet from Slip 3 to a mean of .07 (ppb) at the mouth of the harbor. Figure 4 shows these concentrations. The concentrations in the sediments of the harbor are discussed above and shown in Figure 2. These water column concentrations were used with a mathematical

model of the hydrodynamics of the Harbor to estimate the release of PCB to Lake Michigan resulting from PCB's dissolved in the water column and the transport of PCB-contaminated sediment under steady state conditions. The estimated rate of release is 22 lbs per year. Sampling in the North Ditch shows the water column concentration, both dissolved and particulate, in that area to average 7 ppb. Again, this concentration was used with a mathematical model of the hydrology to estimate the PCB loading to Lake Michigan through the North Ditch. The rate of release from the North Ditch due to both dissolved PCB's and PCB-contaminated sediment is estimated to be about 7 - 20 lbs. per year. The results of the sampling of the soils and sediment is discussed above and shown in Figure 3.

In addition to monitored sediment data at the site itself, sampling of the surficial sediments in Lake Michigan indicate the presence of a "plume" of contaminated sediments moving from Waukegan. The shape of the "plume" strongly suggest that Waukegan is contributing to the contamination of Lake Michigan sediments. See Figure 4.

3. Ground Water:

Extensive ground water contamination was documented in two comprehensive ground water monitoring projects conducted in 1979 and 1980. The studies showed PCB in the ground water in concentrations up to 35,000 ug/l. This studies showed the contaminated ground water is moving slowly toward Lake Michigan and will become a significant source to the Lake in 30 - 60 years.

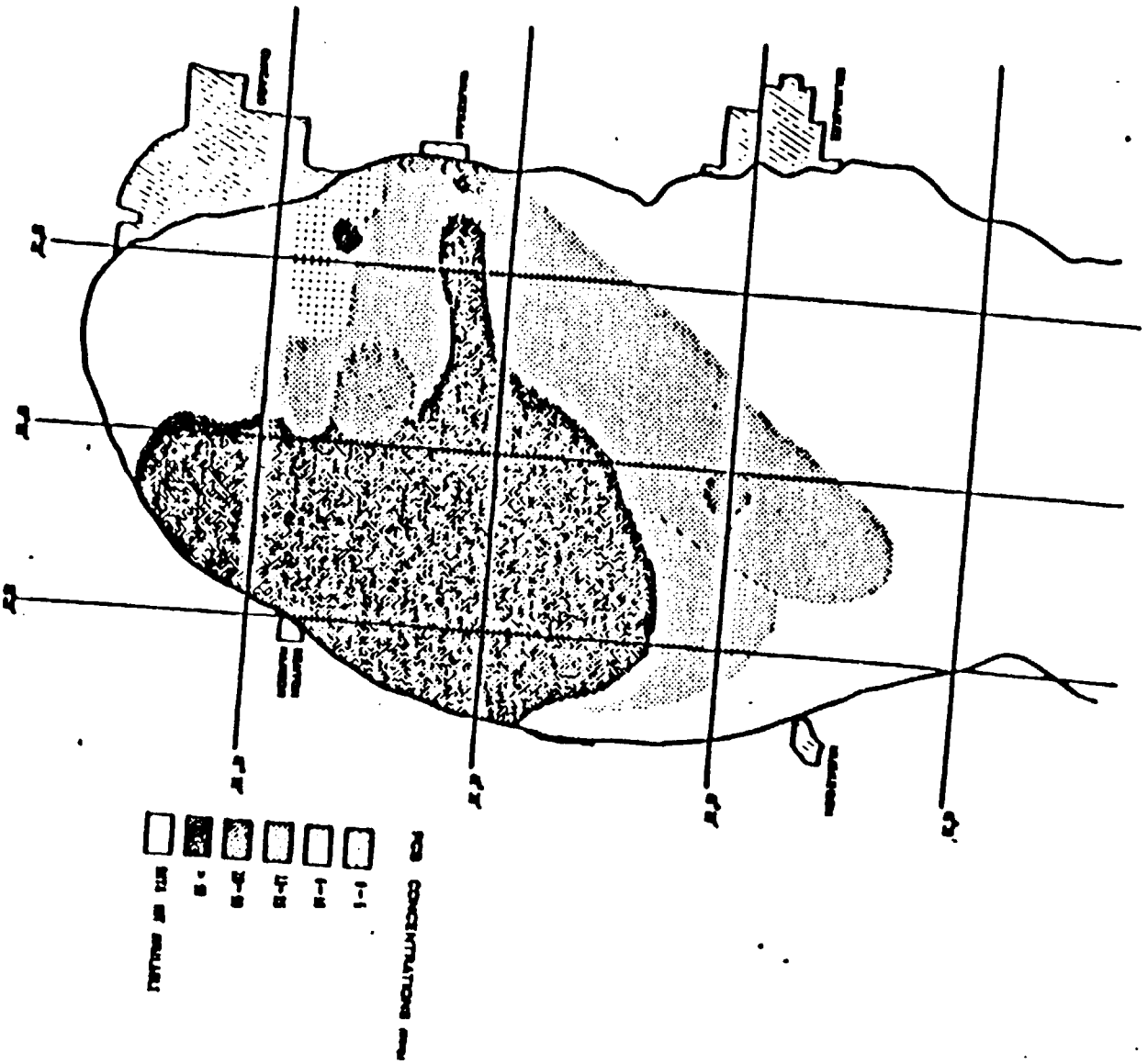


Figure 1-6. Generalized distribution of PCB concentrations in the surficial sediments of the southern basin of Lake Michigan. Derived from data gathered by Armstrong (1980).

The annual rates of release through each media from both the harbor and the North Ditch areas is as follows:

Annual Rates of Release of PCB
from OMC
(Pounds/year)

	Air	Surface Water & Sediment	Ground Water
Harbor	12-40	22	N/A
North Ditch	15	7-20	N/A
Parking Lot	N/A 37-55	N/A 27-42	Future Release of 8 lbs/year 8

In addition to the annual release of PCB's from OMC due to normal transport mechanisms, the site represents a hazard to environment due of the possibility of a large, catastrophic-type release due to extreme storms. The modeling of steady PCB movements lakeward and the assumptions concerning extreme summer season meteorological and hydrologic events do not take into account the potential of the violent Lake Michigan storms of late fall or winter which cannot, practically speaking, be measured and modeled. The lakeward movement of PCBs out of the Harbor during the winter may be underestimated and hence the range of annual PCB flux presented should be viewed as conservative.

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Waukegan Charter Boat Association members include eight 4-passenger boats and nineteen 6-passenger boats. The charter season generally runs from 15 April through 15 October. The charter trips leave the dock twice a day, at 7:00 a.m. and 1:00 p.m., and operate seven days a week. The Charter Boat Association estimates that its 27 boats have between 12,000 to 15,000 paying clients.

This boating activity results in substantial fishing pressure. There are 14 public boat access points along the Illinois shoreline to serve the entire metropolitan region. Although Waukegan is 40 miles north of Chicago, the major population center of the region, the Waukegan area experienced the greatest fishing pressure along the entire Illinois shoreline of Lake Michigan. This estimation is based on a 1979 sport fishing creel survey conducted along the Illinois portion of Lake Michigan by the Illinois Department of Conservation.

The results of the creel survey indicated that the heaviest pier/breakwater fishing pressure was experienced at the Waukegan Harbor and that the heaviest boat fishing pressure was experienced offshore from the Waukegan Harbor. The survey personnel estimated that a total of 222,918 angler hours were expended for pier/breakwater fishing along the Illinois shoreline. At the Waukegan Harbor, the 1979 estimate of angler hours was 45,974, or 21% of the total. However, the average number of fish caught per hour at the Waukegan Harbor was the second

lowest rate of the 14 sites listed.

The estimates for the trolling fishery also indicated that more angler hours were expended at the Waukegan Harbor than at any of the other locations. Of the total 601,426 estimated angler hours spent trolling, 184,554 (31%) were allocated to Waukegan Harbor. As for the pier/breakwater fishery, the number of fish caught per hour was relatively low. The majority of the fish caught by both pier/breakwater and trolling fishing were coho salmon. Half of all the coho caught from the pier/breakwater fishery were from Waukegan Harbor. The Waukegan Harbor trolling fishery accounted for 34% of all the coho salmon caught along the Illinois shoreline in 1979.

Although significant fishing activity took place on the Waukegan breakwater and from boats in 1979, relatively little shore fishing occurred at the Waukegan Harbor. Of the 285,374 angler hours estimated for the 1979 shore fishery, only 1,179 (0.4%) were allocated to the Waukegan Harbor.

IV. EVALUATION OF THE "NO ACTION" ALTERNATIVE

Studies conducted by EPA have shown that high concentrations of PCB exist in all segment of the OMC site (Waukegan Harbor, North Ditch, and the OMC parking lot). In addition, sampling and modelling studies have shown that the PCB's are leaving the site through the flushing of water from the Harbor and the

North Ditch, the movement of ground water toward lake Michigan, the transport of sediment into Lake Michigan and the volatilization of PCB's to the atmosphere.

The investigations regarding the human health and environmental impacts of exposure to PCB's have shown that PCB's are both toxic and uniquely persistent. The release of PCB from the site were evaluated and it was determined that the release is resulting in a public exposure to PCB. These evaluations showed that the public is being exposed or potentially exposed to the PCB's released from OMC through the drinking water supply, consumption of contaminated fish, skin contact with contaminated material, and inhalation of volatilized PCB's. In addition, the PCB's being released from OMC are having a negative impact on the environment of Waukegan Harbor and the nearshore area of Lake Michigan.

Finally, a no action alternative may result in indefinite postponement of the dredging of the navigation channel. If routine channel dredging were precluded, deep draft shipping activity would eventually cease as a result of sedimentation at the Harbor mouth.

Although the economic contribution of the Harbor industries that are dependent on a working harbor for their operations to the overall economy of the area has not been qualified, the impacts associated with a further curtailment in use of Harbor would be substantial. Such a curtailment

would be expected if no action was taken to abate PCB contamination in the Harbor because of the potential hazards associated with Harbor maintenance activities.

Because of the known and potential threats to public health, welfare, and the environment specified above and associated with the release of PCB's from the OMC site, remedial action has been determined to be necessary to stop the continued release of PCB's from the site and the spread of PCB's to Lake Michigan and the food chain.

Under CERCLA, the remedial action taken to control the PCB's must be determined to be cost effective based on engineering, environmental and economic criteria. EPA conducted a feasibility study to evaluate the potential remedies for the site.

V. FEASIBILITY STUDY

A. Screening of Alternatives

In order to determine the most effective remedy to control the release of PCB from the OMC site, EPA has evaluated more than fifty treatment alternatives and technologies. These alternatives included in place destruction of the PCB with UV/ozonolysis, biodegradation and oxidation; in-place fixation with sorbents and seals; in-place separation of the PCB and removal; removal of the contaminated soils and sediment; alternatives to bypass the contaminated material; water treatment technologies; onsite

storage and offsite disposal or storage/disposal.

Although there is a lot of research on innovative methods of destroying or fixing PCB's and several alternatives are potentially promising, there are relatively few technologies that have been proven to be effective on PCB contaminated soil and sediment. In reality, the only proven feasible technologies approaches available are the traditional alternatives of (1) excavation and offsite disposal or incineration or incineration and 2) containment of the material on site. The variations on these primary alternatives were evaluated in detail to determine the best way of accomplishing each option. The combination of treatment technologies considered most appropriate for each of the two generic alternatives is described below.

B. Excavation and Offsite Disposal:

If implemented in Waukegan Harbor, an offsite disposal option would require several steps. A sediment dispersal control device, consisting of a double silt curtain or sheet piling, would be installed across the south end of the upper Harbor to ensure that sediment disturbed during dredging does not escape to Lake Michigan. Sediments contaminated with PCBs would be removed with a hydraulic dredge (a suction line) and the sediment slurry pumped through a pipeline to the initial solids dewatering lagoon. Because the hydraulic dredge cannot penetrate the area of deep contaminated sand and silt near the

OMC outfall, a mechanical dredge would be used to remove this material;

The deep dredging would be performed inside a single sheet pile cofferdam. The solids would be loaded onto trucks and transported to the initial solids dewatering lagoon. All removed water and process water would be routed to a water treatment plant for suspended solids and PCB removal (to 1 ppb PCBs), then discharged to the harbor or to a sanitary sewer.

The dredged solids would be dewatered, fixed and transported to an approved disposal site.

In the areas north of the OMC plant, the excavation and off-site disposal would be somewhat simpler because underwater dredging would not be necessary. However, several steps will be required for the remedy. A bypass would be constructed to divert surface water flow around the highly contaminated areas of the Crescent Ditch and Oval Lagoon directly to Lake Michigan. Construction would then begin on a structural slurry wall (or other structural support system) around the Oval Lagoon. The soils would be dewatered using well points and pumps. Well water would be routed to an onsite water treatment plant for suspended solids and PCB removal (to 1 ppb PCBs), then discharged to the lake or to a sanitary sewer.

Soils contaminated with PCBs would be excavated with a backhoe or front end loader, fixed with portland cement or another fixing agent, cured and transported to an approved

disposal site. Because the material in the Parking Lot area is not expected to be flowable, the intermediate step of hydrating the soil with a fixing agent is considered unnecessary.

The excavation and offsite disposal options are the most reliable remedial alternatives for the OMC site. The OMC site is located immediately adjacent to Lake Michigan. The Waukegan Harbor portion of the site is hydrologically connected to Lake Michigan and the northern areas of the site have ground water only three feet below the surface. Sediment and soil from the area is continuously transported to the Lake. By excavating and removing the PCB contaminated material from the site, the transport of PCB to the Lake, and the accompanying threat to public health and the environment is stopped. There will no longer be high concentrations of PCB adjacent to the lake so all of the threats described earlier are eliminated. Under this alternative, the PCB contaminated material would be disposed of in a chemical landfill as defined under the PCB regulations (40 CFR 761). This type of landfill is designed specifically to contain hazardous material and is located so that the physical environment will not act to deteriorate the containment cells. The EPA, by promulgating the PCB regulations, has established that chemical landfills as defined in the PCB regulations are safe, reliable receptacles for PCB contaminated material.

The other generic type of alternative available for dealing with the PCB contaminated material involves containing the material on-site in such a way that the release of PCB's to Lake Michigan is prevented. In the Waukegan Harbor area, this type of alternative would require both dredging of material and building a containment cell.

A slurry wall extending into the glacial till would be constructed tying into the glacial till around the entire perimeter of the containment area. This slurry wall will seal the sides of the containment cell and the impervious glacial till found beneath the slip will seal the bottom of the cell.

Dredged sediments from Slip 3, Upper Harbor, Oval Lagoon, and Crescent Ditch and excavated soil from the parking lot will be placed within one or more of containment area. Supernatant from dewatering these solids would be continuously decanted and routed to an onsite water treatment plant for suspended solids and PCB removal (to 1 ppb PCBs), then discharged to the harbor or to a sanitary sewer. During dewatering, volatilization of PCB's is likely to increase because the highly concentrated sediments are exposed. This volatilization will be temporary and will be minimized by using management practices. After dewatering, the containment cell or cells would be sealed with a three foot impermeable clay cap. Ground water monitoring wells would be installed around the site for detection of any future PCB migration.

In the area north of the OMC plant, a gravity pipeline bypass would be constructed to divert surface water flow around the highly contaminated areas, the Crescent Ditch and Oval Lagoon. This bypass would collect drainage from the storm drain (that flows north at the west edge of OMC's property), from OMC plant roof drains, and from regraded areas north and south of the Crescent Ditch and discharge it to Lake Michigan. It would be constructed south of the sheet piling just north of the east-west portion of the North Ditch. The Parking Lot area would be regraded to divert surface water flow to catch basins.

Containment will effectively control the major mechanisms for the release of PCB from the OMC site. The volatilization of PCB will be prevented because the containment cells will be capped with several feet of impervious material. The transport of contaminated sediment will be eliminated because the sediment will contain behind impermeable slurry walls. Finally, the contamination of surface water with PCB will be eliminated because the water will no longer be in contact with PCB contaminated sediment.

Because no slurry wall is completely impermeable, the containment cells will release very small quantities of PCB very slowly. Based on an overall permeability of 10^{-7} cm/sec, migration of PCB's through 2 ft slurry walls around the containment cells will disperse about 0.003 lbs of PCB per

year. Assuming the same permeability for the glacial till, migration through a one foot layer of glacial under all the containment areas will disperse about .03 lbs per year. If cracks occur in the slurry wall or if pockets of permeable material are present in the glacial till, this dispersion will occur faster. These rates of dispersion are much less than the 55 - 100 lbs per year EPA models showed being released under present conditions.

Although the containment cells will control the release of PCB, they do not completely eliminate the threat of release to Lake Michigan. It is not possible to build a 100% reliable containment cell at the location of the OMC site. The cells will be subject to groundwater fluctuations which may induce freezing and drying of the slurry walls and subsequent cracking. The glacial till which will make up the bottom of the containment cells is not a homogeneous impervious bottom such as would be built into man-made landfill. There may be small pockets of permeable material through which PCBs could imigrate. Because the containment cells will be in the Lake Michigan any release from the cells will be in the Lake Michigan system.

D. Extent of Remedy:

The options presented above are scoped to cleanup the sediments and soil contaminated to greater than 50 ppm PCB. This limit was based upon modelling of the Harbor done by

Hydroqual (1980). Using a hydrodynamic model of water and sediment transport, Hydroqual estimated the flux of PCB to Lake Michigan if sediments in the Upper Harbor and Slip No. 3 are contaminated with 500, 100, 50, 10 and 1 ppm PCB. The modelling studies showed that if all sediments contaminated to greater than 100 ppm are contained or removed from the Harbor and steady state conditions are assumed, the flux of PCB to Lake Michigan will approach zero, the water column concentrations in the Harbor itself will be reduced to less than 0.02 ug/l, the ambient water quality standard, and fish residing in the Harbor will not accumulate PCB to greater than 5 ppm, the FDA standard.

These modelling studies did not address the turbulence introduced into the Harbor by boat traffic and heavy storms, however. It is estimated that as much as 2 pounds per year of PCB would be released to Lake Michigan due to the turbulence of sediments contaminated to less than 100 ppm. In order to bring the estimated release of PCB from the Harbor to approximately zero and provide some margin of safety for the fish in the Harbor, this project will dredge so that the sediments remaining will have concentrations of PCB less than 50 ppm. Similar considerations apply in the area north of the OMC plant.

In addition, sampling of the surficial sediments in Lake Michigan show that a good portion of the lake bottom has sediments contaminated to about 50 ppm. See Figure 4. By dredging the Harbor to less than 50 ppm, EPA is essentially ensuring that that the Harbor bottom is approximately equivalent to that of Lake Michigan. No benefit to public health or the environment will be achieved by dredging and containing sediments less contaminated because that would make the OMC site cleaner than a good part of Lake Michigan, the receptacle of the PCB from OMC.

Although there is no modelling available for the area north of the OMC plant, considerations similar to those regarding the Harbor area suggest that 50 ppm is an appropriate level of cleanup for the whole site. In addition, such a level of cleanup would ensure that the material excavated as part of construction of the slurry walls would not require off-site disposal at a chemical landfill. Finally, a 50 ppm level of cleanup provides a consistent objective for the cleanup of the entire site.

VI. THE COST EFFECTIVE REMEDY

Because of the problems of reliability of containment cells built in proximity to Lake Michigan, containment is considered significantly less effective than offsite transport and disposal of the PCB contaminated material at a chemical landfill as defined by the PCB regulations.

The Environmental Protection Agency has consistently held that the public health risks associated with PCB's, particularly high concentrations of PCB's, are such that the release of PCB's into the environment must be strictly controlled. Because it is difficult to assure a strict reliable control of the PCB's from a site adjacent to and in Lake Michigan, containment on site is not consistent with the Agency's basic regulatory position regarding PCB's or the National Contingency Plan. Thus, the excavation and offsite disposal option is considered the only remedial action for the OMC site which effectively mitigates and minimizes risk to public health and the environment.

In defining the most cost-effective technique for accomplishing excavation and offsite disposal, several options were evaluated. These options involved alternative methods of dewatering the material dredged and excavated from Waukegan Harbor and the area north of the site. The options available for the dredged sediments in the Harbor are:

1. Dredge - Dewater in Lagoon - Fix - Dispose
2. Dredge - Dewater in Barges - Fix - Dispose
3. Dredge - Dewater in Lagoon - Dispose

Option 2, which requires dewatering of the sediments in barges is not a feasible option for the extremely large quantities of material which will be dredged from the Upper Harbor area.

Although dewatering in lagoons is a viable alternative for the

smaller quantity of material to be dredged from Slip 3, construction of lagoons would be required to dewater the sediments from the Upper Harbor. Thus, the minimal savings in terms of dredged sediments from Slip 3 would be offset because the simplicity of one technique and economies of scale attained by treating the sediments in the Slip and the Upper Harbor in the same fashion would be lost.

Option 3, would depend upon evaporation to dewater the dredged sediments. Although this is technically feasible, the evaporation would result in significant quantities of PCB being volatilized from the site. It is estimated that as much as 63 pounds/day PCB would volatilize during dewatering. The environmental impacts of this remedy are too significant to consider it any further.

The most cost-effective remedy for the excavation and disposal of material from the Waukegan Harbor is to Dredge - Dewater in Lagoons - Fix and Dispose as described above in the discussion of general excavation and offsite disposal techniques.

For the contaminated material north of the site, several options for excavating and dewatering the material. These options are:

Excavate - Dispose

Excavate - Fix - Dispose

The fixation step is necessary to ensure that the material is

not flowable, that is, that it will not spill as a liquid. The materials to be removed from the Oval Lagoon/Cressent Ditch area are expected to be as wet a dredge spoils and, as such, the material will need to be dewatered or "fixed" before it is safe to transport it in trucks, etc. A fixing agent such as concrete, lock sorb, etc. must be added to the material to prevent lost of contaminated water during transport.

On the other hand, the material in the parking lot expected to be dry after the ground water is drawn down with pumping wells and it will not spill as a liquid, even without fixation. Therefore for material in the parking lot the fixation step is not considered necessary.

The cost-effective remedy for the OMC site is:

Dredge - Dewater in Lagoons-Fix-Dispose for	
Waukegan Harbor	\$35,500,000
North Ditch Area	
Excavate - Fix - Dispose	\$26,820,000
Parking Lot	
Excavate - Dispose	\$12,570,000
Total	<hr/> \$74,890,000

This remedy will have no adverse impacts on the current use of the land because all contaminated material will be removed from the site. All areas will be filled with clean material and graded to preproject elevations.

VII. FUND BALANCING

Under section 104(c)(4) of CERCLA and §300.68(k) of the National Contingency Plan, EPA is required to select the most cost-effective remedy which provides a balance between the need for protection of public health, welfare and the environment at a facility and the amount of money available in the Hazardous Substance Response Trust Fund (Fund) to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into account the need for immediate action. In evaluating the appropriate extent of remedy for OMC, EPA must consider the need to respond to other releases with Fund monies.

Because the estimated cost to implement the cost-effective remedy for the OMC site identified above exceeds \$70 million, EPA has conducted an analysis of Fund assets in which expected Fund receipts are compared with expected future needs for remedial actions at sites currently listed on the National Priority List. In addition, we have considered the expected expenditures for immediate and planned removals and other program needs. These analyses have shown that implementation of the cost-effective remedy at the OMC site will have serious impacts on EPA's ability to respond at other hazardous waste sites.

EPA's Superfund budget prepared for FY 84 allocated \$3.4 million for remedial construction at the OMC site. The difference

between this allocation and the \$73 million necessary to fund the cost-effective remedy is \$69 million or two thirds of the \$_____ million FY 84 budget for remedial investigation, feasibility studies and construction. EPA's analysis shows that if the cost-effective remedy is implemented, approximately 100 other projects currently underway or planned for FY 84 would have to be cancelled.

The situation is not expected to improve in FY 85. The FY 85 budget for the entire Superfund program including immediate and planned removals, expected to be approximately \$510 million. EPA's analysis show that this FY 85 budget will essentially consume all of the monies left in the Trust Fund. Of that \$510 million, an estimated \$300 million will be available for remedial actions. The cost-effective remedy for OMC would require 10% of the entire program budget and 22% of the dollars planned for remedial action. The program has identified more than 60 remedial construction projects which will be ready for implementation in FY 85. The total costs of those construction projects will exceed the \$300 million expected to be available. Thus, if the cost-effective remedy of OMC is implemented, approximately 8 other construction projects must be cancelled, assuming an average cost of \$6 to \$8 million for each project.

In light of the high cost of the remedy for the OMC site, both in terms of dollars and other actions which would have to

be foregone, the Agency has decided to consider other remedial actions for the OMC site. If the PCB contaminated material at the site can be controlled to the extent that the annual release of PCB from the site goes to zero and the relative risk of public exposure to PCB is minimal, then Fund balancing may be appropriate. In evaluating other remedial alternatives, the Agency's objective was to find the least cost alternative which controls the PCB contaminated material on-site such that the release of PCB's from the site will approach zero.

VIII. FUND BALANCED ALTERNATIVE - RECOMMENDED FOR IMPLEMENTATION

In evaluating other remedial options for the OMC site, on-site containment alternatives were considered. This type of technology was the only technology proven control the release of PCB contaminated sediment and soils other than the offsite disposal option which is the cost-effective remedy.

As stated above, there are serious problems associated with the reliability of onsite containment. It is impossible to build a containment cell at the OMC site that is equivalent to PCB landfills defined in the PCB regulations. In looking at options for Fund balancing, therefore, the Agency tried to develop a balanced combination of options that takes in to account the lesser reliability of the onsite containment cell yet minimizes the very expensive offsite transport and disposal. Accordingly, the option recommended for implementation includes both offsite disposal and onsite containment components. In

addition, the recommended option includes extensive post closure monitoring of the containment cells to ensure their continued integrity.

A. Waukegan Harbor

1. Hot Spots

In some portions of the site, the concentrations of PCB are so high that any alternative other than off-site disposal could not be considered even minimally acceptable protection of the public health. This is the case for those highly contaminated sediment identified in Slip No. 3. The extremely high concentrations of PCB's in a relatively small volume of material mandates that this material be handled with great care and placed in a highly reliable a chemical landfill, which is designed to protect public health to the greatest extent possible.

As identified in the Feasibility Study and previous work prepared by Mason and Hangar Company, the presence of extreme high concentrations of PCB's exerts an unacceptable diffusionary pressure on underlying sediment or toward any slurry wall which would be built to contain such material. Removal of the most highly contaminated material for offsite disposal is necessary to control the driving force that is causing the PCB's to spread into the underlying clay. This is demonstrated by the core data from the slip which shows that in areas of highest contamination, (those to be included within the cofferdam)

PBC's have moved downward into the clay and in areas of lesser contamination (outside the cofferdam) the PCB's have not penetrated the underlying clay. Thus, if the material is not removed, the containment cell would be much more prone to leakage.

In addition, the feasibility study demonstrates that after two years the containment cells will begin to leak a small quantity of water, based on a permeability coefficient of 10^{-7} centimeters/minute.

If the highly contaminated material is not removed, the leachate will considerably more contaminated and thus present a larger threat to public health and the environment. There is no alternative less costly than the cost-effective remedy that approaches the effectiveness of off-site disposal. EPA can not Fund Balance to a lesser remedial action. The costs of off-site disposal of these sediments is \$3,150,000.

2. Less Contaminated Portions of Slip 3 and Upper Harbor

The less contaminated sediments in Slip No. 3 and Upper Waukegan Harbor may be contained onsite. Because the sediments in this area are contaminated with PCB's in lower concentrations, the glacial till which is beneath the Harbor and the OMC site will act as an effective seal. No PCB's have been found in the till under moderately contaminated sediments. Therefore, adequate containment onsite is possible for these moderately contaminated sediments.

This containment will effectively control the major mechanisms for the release of PCB from the OMC site. The volatilization of PCB will be prevented because the containment cells will be capped with several feet of impervious material.

The transport of contaminated sediment will be eliminated because the sediment will contain behind impermeable slurry walls. Finally, the contamination of surface water with PCB will be eliminated because the water will no longer be in contact with PCB contaminated sediment.

EPA has developed two ways to contain this material on-site; dredging the Upper Harbor to contain the contaminated material in Slip 3 and dredging both the Upper Harbor and Slip 3, dewatering the material and containing it on OMC property. The latter option was considered briefly in the feasibility study because it was more expensive and complicated than containment in Slip 3 and was less reliable than the cost-effective remedy, off-site disposal. The reappraisal of this option as a result of the planning process is described below.

a. The Planning Process

EPA proposed containment of the contaminated sediments from Waukegan Harbor in Slip 3 in the feasibility study published in July of 1983. Building a containment all in Slip 3 will essentially close that slip, landlocking the owners on either side of the slip. As originally planned, the construction of an alternate slip on adjacent land would be a component of that

containment. Upon further consideration within the Agency, however, it was determined that the ability of EPA to build such a facility under the Superfund was questionable.

b. Additional Public Comment

EPA reopened the public comment period on March 4, 1984 to receive comments on the impacts of closing Slip 3 without providing an alternate slip. This public comment period closed on April 4, 1984. Over two hundred and fifty comments were received by the Agency. Many comments addressed the negative impact of the closure of Slip 3 on the community's recreational and commercial facilities, on the financial base of the Port of Waukegan, the tax base of the City of Waukegan and the general well being of the community.

c. Final Alternative

The negative impacts of the remedy proposed on the socio-economic well being of the community, as highlighted the public comments, led EPA to reconsider the other containment option, containment on OMC property. The relatively small additional costs and complexity involved in dewatering the dredge spoils and disposing of the material on OMC property are offset by the negative impacts inherent to containment of the material in Slip #3.

The containment option recommended is containment of the contaminated sediment from Slip 3 and the Upper Harbor on the OMC parking lot.

The parking lot area is recommended for containment of the sediment because the parking lot already contains 68,000 yd³ of contaminated material. A containment cell, described below, is necessary to control this material in place under the parking lot. Containing the dredged material from the Harbor in the same containment cell saves dollars. The extra material will raise the height of the cap approximately 8 feet to 14 feet above the surrounding grade. The Harbor sediment will contain some sediment more contaminated than the material already in the parking lot. Because the average concentration will be approximately the same, however, the containment will present no additional threat to the environment.

Following hot spot removal discussed above, the remaining sediment in Slip #3 remaining contaminated will be removed from the harbor by hydraulic dredge and pumped through a pipeline to the initial solids dewatering lagoon. This sediment is moderately contaminated and requires special handling to reduce PCB volatilization. The sediment will then go through the same fixation process as the most highly contaminated material, but will then be transported to the parking lot area for disposal.

The harbor sediments contaminated in excess of 50 ppm PCBs would be removed by hydraulic dredge and the sediment slurry pumped through a pipeline to the initial solids dewatering lagoon.

Solids would be dewatered in a clay-lined dewatering lagoon constructed on OMC property. The supernatant would be continuously decanted and routed to a 1,500-gpm water treatment plant. After dredging activities are completed, a 200-gpm water treatment plant would treat rainwater and leachate water for the duration of the dewatering process.

A riverine utility craft (RUC) would be used for channeling the sediments to allow surface drainage. The top layer of solids would be dried by evaporation. The dried solids (typically the top one to two feet) would be periodically removed by dragline. The solids would be loaded into trucks and transported to the parking lot area. This process would be repeated about six times over a 2-year period to remove the solids. The dredged sediments, contaminated liner material, and contaminated lagoon material would also be disposed in the parking lot area. The foundry property would be returned to its vacant condition, following dewatering. The height of the OMC parking lot is estimated to raise from its current elevation by about 14 feet. The cost of this option is estimated to be \$ 9,940,000.

Upon completion of this project the harbor, Slip 3, and the vacant property can be returned to its existing use. Actual dredging is estimated to take 60 days and will be scheduled to avoid the boating season to the greatest extent possible.

B. Oval Lagoon and Crescent Ditch

Some of the sediments in the Crescent Ditch/Oval Lagoon area of the site are as highly contaminated as those in Slip #3. Fund balancing is not appropriate for these sediments for the same reasons as it was inappropriate for the Slip #3 sediments; containment does not provide adequate protection of public health and the environment because the glacial till has been shown to be unable to adequately prevent migration of that material.

Off-site removal and disposal in an landfill as defined in the PCB regulations is necessary to ensure the reliability of the containment cell bottoms and sidewalls and to prevent the leachate from the cell from becoming more concentrated due to the highly contaminated material within the cell.

Contaminated material remaining after hotspot removal will be contained in place through the use of slurry walls and a clay cap. In addition to the material generated as a result of sewer installation will be contained on site.

This containment structure is necessary to bring annual rates of release dose to zero from this portion of the site. Surface water and ground water flows will be removed from contact with the contaminated material. The containment cell will be more reliable because the most highly contaminated material will be removed for offsite disposal. The mechanisms of release

of the PCB's will be essentially halted by implementation of this alternative.

- a. Some increased volatilization will take place while the construction is underway, but once the clay cap is in place, volatilization will be reduced to zero.
- b. Ground water flows will be diverted around the containment site by the slurry walls.
- c. The underlying till will prevent the release of PCB-contaminated sediment because of its thickness and impermeability.
- d. Surface water will be diverted around the cell by the impermeable clay cap. Contaminated material will no longer be in contact with surface water and surface water dispersion of PBC's will be halted.
- e. Sediment transport will be stopped because the material will be contained in a cell.

C. North Ditch

Under this alternative, the North Ditch will be partially excavated in order to install a bypass sewer pipeline. As stated above contaminated soil from the excavation would be placed in the Oval Lagoon area and capped with clay. A series of manholes would be built into the sewer and surface drainage routed to the manhole drains. This will separate surface flows from contaminated material. Under the recommended Fund Balanced

place under the storm sewer. Protection of public health is provide because these soils are isolated from release to the environment. Recontouring of the surface profile, a result of implementing the above-mentioned alternatives, will alter ground water exposure to the soils and reduce flows through the area. The contaminated soils are isolated on the north side by existing sheet pile and flows on the other sides will be reduced by the sewer, capping and installation of the parking lot slurry wall, and installation of sheet pile on the south side of the ditch. The main method of release of PCB's from this project sub area is via the flowing water in the North Ditch. Volatilization is also associated with the flowing water. Implementation of the fund balanced alternative will eliminate the mechanism of release in the following ways:

- a. Surface water flows - This is the main mechanism of release of PCB's from the site to Lake Michigan. Surface water flows will not transport PCB contaminated sediment toward Lake Michigan because they will be isolated within the pipe. Likewise, dissolved PCB's in the water will be reduced to approximately zero because the water will not be exposed to contaminated sediment.
- b. Ground water flows - Some contaminated sediment which remains in the ditch, after stallation of the sewer will still be exposed to ground water flows. There will be a potential that a small quantity of PCB's

would leave the site through this mechanism of release, however, the ground water flows will be reduced because the ditch after sewer installation will be graded and capped. Surface flows, being directed to sewer inlets, will reduce the amount of water available to transport PCB's offsite. Under the fund-balanced alternative, the extent of remedy is viewed as sufficient to protect public health, but less effective than the cost effective remedy which would require complete sediment removal and backfilling prior to sewer construction.

- c. Volatilization - This will be significantly reduced because the entire area will be capped.

D. Parking Lot

The recommended fund-balanced approach for dealing with the large volume of contaminated soil in the parking lot involves in place incapsulation. Approximately 277,700 pounds of PCB's in 105,000 yd³ of soil would be contained and capped in the parking lot area. Slurry walls would be constructed around the perimeter of the major contamination and tied into the underlying glacial till. The underlying till would be relied upon to contain the downward movement. A clay cap would seal the top preventing surface water percolation into the cell. Riprap would protect the east edge of the cell from wave or other erosion actions. Encapsulation was chosen as the fund-

balanced alternative over excavation and removal, the cost-effective alternative, because it provide a high degree of protection of public health and the environment for substantially less money. The PCB's in the parking lot have been shown to be moving slowly toward Lake Michigan. The fund-balanced alternative will further slow or contain that release of PCB's to the lake environment. The fund-balanced alternative controls the mechanisms which were causing the PCB's to leave the site.

1. Ground Water - Ground water movements are the main driving force here, causing the PCB enclaves in soil to move slowly toward Lake Michigan. Surrounding the contamination mass with slurry walls will divert the ground water flows away.
2. Surface Water - Surface water currently percolates through the surface and sand exerting pressures on the PCB masses to move down gradient. The surface water route will be eliminated because of cap. This will help keep the PCB's in place.
3. Volatilization - Currently, volatilization is rather small because of soil cover and the site is partially paved. However, the cap will aid in further reducing ulitization.

Technical components and costs of the remedial alternative recommended for implementation of, given Fund Balancing considerations are summarized in Table ____.

D. Evaluation of threat Under Fund Balanced Alternative:

In sections I and III of this documentation it was shown that the uncontrolled PCB's at the OMC site were being released from that site in significant quantities and were posing a threat to public health and the environment as a result of that release. The alternative described above will successfully control the PCB's at the site and bring the release of PCB/s to almost zero. In doing so the threat to public health and environment posed by the site will be mitigated so long as the containment cells function as they are designed. It is the lack of long term reliability in containment cells located so close to Lake Michigan that prevents the containment option from being the most cost-effective option. Because the Agency has serious concerns about the long term reliability, off site transport and disposal is considered the minimum adequate alternative.

The fund balanced alternative which includes both off site disposal and on site contamination is only slightly less than adequate, however. The very highly contaminated material is removed from the site and the threat posed by the moderately contaminated material is mitigated because material is contained.

The threat posed to public health and the environment by the sit after this option is implemented will be small. Because this alternative provides almost as much protection for significantly less cost than the cost effective option, Fund balancing is considered appropriate at this site.

IX. TSCA

As the recommended fund-balanced alternative includes the construction of two on-site containment structures for the disposal of PCB dredge material and soils, the Region evaluated this action in light of the Toxic Substances Control Act (TSCA) regulations (40 CFR Part 761).

Pursuant to 40 CFR Part 761.60(5), all dredged materials that contain PCBs must be disposed of in one of three ways:

1. in an incinerator which complies with 40 CFR Part 761.65; or
2. in a chemical waste landfill which complies with 40 CFR Part 761.65; or
3. upon application, using a disposal method to be approved by the Regional Administrator in the Region where the PCBs are located.

The Regional Superfund Office applied to the Regional Administrator for the approval of an alternate disposal method. The Regional Administrator denied the application. The decision was based upon the failure of the proposed landfill to meet a number of technical requirements traditionally required for approval of an alternate disposal method. The denial cited the following issues as its basis: the lack of a synthetic membrane liner for the containment cells; the fact that the landfill was not 50 feet from the historic high water table; the lack of an internal leachate collection system; and the lack of a 6 foot woven mesh fence surrounding the landfill.

DOCUMENTS SUBMITTED IN CONJUNCTION WITH
RECOMMENDATION FOR REMEDIAL IMPLEMENTATION
ALTERNATIVE SELECTION - OMC HAZARDOUS WASTE SITE
WAUKEGAN, ILLINOIS

1. Summary of Written Public Comments on the Source Control Feasibility Study on the OMC Site (July 15 through September 1, 1983).
2. Summary of Comments OMC Public Meeting August 3, 1983.
3. Breakdown of Public Comments Received during March - April 1984 Public Comment Period on OMC.
4. Application for Approval of an Alternate Disposal Method to be used for Dredge Materials that Contain PCBs at the OMC - Waukegan Harbor Hazardous Waste Site.
5. PCB Landfill, Waukegan Illinois.
6. U.S. Department of Interior letter dated December 14, 1983.
7. Department of the Army letter dated August 15, 1983.
8. U.S. Corp of Engineers memorandum for record re: Chemical Test on Geotechnical Samples at OMC.
9. CH₂M Hill letters dated: May 6, 1983, May 24, 1983, June 22, 1983, October 31, 1983, November 21, 1983, March 13, 1984, April 4, 1984, April 6, 1984, April 10, 1984, and April 17, 1984.

Jack Dean

SUMMARY OF WRITTEN PUBLIC COMMENTS ON THE
SOURCE CONTROL FEASIBILITY STUDY ON THE OMC SITE
JULY 15 THROUGH SEPTEMBER 1

A. Written comment by: Lake Michigan Federation and Citizens
for a Better Environment

1. They find the recommendations proposed in the feasibility study unacceptable because they would leave behind almost one-third of the PCBs that contaminate the soil and sediments of Waukegan Harbor. The cleanup must be complete in quantity as well as quality.
2. Use of the harbor for containment would create a chemical waste landfill. The site is unacceptable as a landfill because it is underlaid by till, it is near surface water and shorelands, and it has a high groundwater table.
3. Landfills merely store wastes, and have a proven record at leakage.
4. Storage will always be cheaper than permanent treatment that destroys or detoxifies PCBs. Future costs of cleanup must be considered as a built-in cost of landfills. Benefits of permanent cleanup must be assessed as well as costs.
5. Several viable options for complete extraction and destruction of PCBs have been overlooked by the feasibility study. Emerging technologies should be re-evaluated.
6. Temporary aboveground storage is an effective way to contain sediments from Waukegan Harbor until a technology for destruction is available. Aboveground storage sites are easier to maintain and monitor than underground landfills, and their visibility in the community would compel the EPA to develop full PCB destruction methods and implement them as soon as possible.
7. Regardless of the disposal option chosen, the dredging operation must be accomplished so that Lake Michigan is protected as much as possible. Use of a clamshell dredge in Slip No. 3 and a double silt curtain in the Upper Harbor may not be adequate to minimize dispersion of PCBs.

8. Transportation of 728,000 pounds of PCBs from the site by truck must be accomplished according to RCRA regulations. Leakage and spillage must be minimized, and special truck routes designed to avoid downtown and residential areas.
9. Any landfilling must be considered a temporary solution. PCBs must be buried only in a licensed PCB landfill, at a site where removal for treatment is possible.

B. Written comment by: Walter V. Porembski (resident)

1. Conclusions of the feasibility study are short-sighted and must not be implemented.
2. Landfills leak. Regulation and maintenance of them is shoddy.
3. The only goal in this project must be complete destruction of PCBs. Until technology enables EPA to detoxify PCBs, Superfund money should be used to contain the concentrated PCBs and prevent storm-water from washing more into the lake.
4. Wants to create a PCB destruction plant at Waukegan Harbor with the \$17 million from Superfund.
5. Feels there is no need to rush the cleanup. The only viable business in the Harbor, Larsen Marine, could relocate anywhere along the 100-mile-long shoreline.

C. Written comment by: Norman P. Proehl
Mining Engineer, Dredging Consultant

1. Believes the only solution is the complete and permanent removal of the PCBs from the area. To do anything less would be an admission that PCBs are not harmful, or would reflect a willingness to pass the problem on to other people at a future date.
2. Proehl's concept is to remove sludge, sediments, and contaminated soil with a specially designed dredge, transport the material through a pipeline to be stored in a properly constructed impounding area for an indefinite period of time.
3. Removal to a safe location, neutralization by incineration, or other means are not considered in the plan.

D. Written comment by: Mike Riesbeck (resident)

1. Concerned about the health hazard the PCB contamination of Waukegan Harbor presents for fish, birds, wildlife, and man.
2. Believes Johnson Outboard Marine Corporation is responsible.
3. Requests that EPA give serious consideration and support to forcing Johnson Outboard Marine Corp. to clean up the Harbor.

E. Written comment by: Linda Haslinger (resident)

1. Questions why no action has been taken to clean up Waukegan Harbor as yet.
2. Concerned about the general population and its consumption of contaminated fish.

F. Written comment by: Bryan Kennedy (resident)

1. He would like to feel safe eating fish and drinking water from Waukegan Harbor.
2. Believes Johnson Motors should be held responsible for the cleanup.

G. Written comment by: Susan S. Pittman (resident)

1. Believes the recommendations are being viewed as a final plan rather than an interim measure.
2. Concerned that PCB residue will remain in an area slated for public and recreational use.
3. Landfills leak.
4. States that not enough is known about the health effects of petrochemical contaminants. Refers to Dr. Theron Randolph's theory that once sensitized to such contaminants people can experience adverse reactions to low level water contaminations.
5. Requests that the public be informed at all times.
6. Waukegan Harbor will not be cleaned up unless PCBs are detoxified and rendered harmless.

H. Written comment by: Christos Dovas, P.E.
District Engineer, Corps of Engineers

1. Feasibility study will meet the criteria required by the Corps' permit regulations for compliance with the National Environmental Policy Act.
2. Comments provided are to strengthen the overall quality of the discussion of environmental impacts in the report.

I. Written comment by: Mary W. Goodbey (resident)

1. She believes that because PCBs accumulate in the fat of humans, insignificant amounts in the air, water, or food may prove to be significant.
2. A faucet water filter, given to her by a student, was analyzed at an independent laboratory. The analysis found less than .5 parts per trillion total PCBs.

J. Written comment by: John Pazereskis, Ph.D.

1. Concerned about the possible relocation of operations at Larsen's Marine Service.
2. Feels Larsen's has done no wrong and they deserve to be treated well.
3. Is worried that the boatmen will either suffer increased fees, due to Larsen's lowered profitability, or lose a place to store their boats if Larsen's must close.

K. Written comment by: Ted Byers, B.S., R.S., Acting Director,
Lake County Health Department

1. Supports the proposed plan for containment of the PCB pollutants in the Waukegan Harbor.
2. Believes it crucial that detoxification take place as soon as it is technically feasible.

L. Written comment by: W. Gerald Thursby, Resident Counsel
Elgin, Joliet and Eastern Railway
Company (EJ&E)

1. Objects to containment of PCB materials on its property. Considers use of its property for implementation of the recommended removal alternative to be taking its property and that it requires compensation.

2. U.S. EPA has failed to state who will be responsible for maintaining the newly created containment area.
3. All PCBs must be removed and EJ&E compensated. They favor implementation of alternatives that will involve removal of as large a quantity of PCB-contaminated soil from Crescent and North Ditch areas as soon as possible.
4. They believe capping the Crescent Ditch, North Ditch, and/or the Parking Lot will create a nuisance constituting an exercise of the government's eminent domain powers as to adjoining lands, and will entitle landowners to compensation.
5. Alternative 4B, Action 3, is the most unacceptable. If Alternative 4B is implemented, EJ&E favors implementation of Subalternative I.
6. Implementation of the recommended plan would be inconsistent with the National Contingency Plan. The containment alternative does not satisfy the cost-effectiveness test because cost should not take precedence over protection of public health, welfare, and the environment.
7. Cost estimates for containment alternatives are understated. They do not include costs for long-term maintenance of the containment areas and costs for compensating property owners for damages resulting from the taking of property.

M. Written comment by: John C. Foley (resident)

1. Offers his own proposal to curtail PCB spread in Waukegan Harbor.
2. Believes more study is required to confirm the level of stability and toxicity of the PCBs.
3. His major concern is preventing the disturbance and resulting movement of PCB-contaminated sediments.
4. To minimize transport of PCBs, he suggests: closing the east harbor entrance; removing all storm drains; halting all testing of motors in the harbor; and sealing and filling Slip 3. Nothing should be dredged.

5. He believes the advantages of his proposal are: minimizing PCB spread in the environment; transforming Waukegan Harbor into a millpond/pleasure-boat harbor; and saving millions of dollars that would be wasted on a futile attempt at removing the PCBs from the environment.

N. Written comment by: The City of Waukegan
Bill Morris, Mayor

1. Believes PCB residues must be removed from the lake.
2. Objects to the landfilling option.
3. Feels the citizens of Waukegan will be expected to deal with the long-term consequences, expenses, inconveniences, health hazards, and worries.
4. Recommends alternative technologies be explored.
5. Wants assurances that when new technologies are developed for destruction of PCBs, any PCBs deposited in landfills on Waukegan's lakefront will be removed and destroyed at the earliest possible opportunity, and in no case would these landfills remain past 1990.

O. Written comment by: Larsen Marine, Inc.

1. Any proposals or action taken by the U.S. EPA would have a massive effect on ongoing operations.
2. Permanent closure of Slip 3 would be extremely damaging to ongoing operations.
3. Believes use of the slip area as a landfill site would raise liability problems.
4. Questions who would maintain the landfill site.
5. Suggests the dredging of Slip 3, if Slip 3 remains open, and the Upper Harbor be done in the off-season, mid-November through April, to minimize the adverse effect on operations.
6. They require an equal amount of dockage or water accessibility in some other adjacent area, on a titled basis, prior to the closure of Slip 3.
7. They expect full and reasonable payment for the cost of moving its fixed equipment and facilities.

P. Written comment by: Tom Gockel
Gockel Marine Charter Service

1. Requests a public apology from the EPA for answering an inquiry incorrectly. (An EPA report is attached to the letter to substantiate his claim.)
2. Feels there is a surreptitious reason he was not sent an Environmental Impact Statement.
3. Suggests the feasibility study was a "rush job," poorly planned and managed.
4. Suspects the EIS demonstrates there is no need to remove the PCBs from the harbor.
5. His information indicates that PCBs are not increasing in volume, and PCBs in the atmosphere are mostly from incineration or evaporation.
6. Recommends using Slip 3 for PCB storage since it has the thickest hard clay bottom of any other site in Lake County.
7. Questions the Hazard Ranking System score for the OMC, and Steve Caldwell's response to an inquiry about the Hazardous Ranking System.
8. Believes the State of Illinois would be obligated to pay 37.5 million dollars to remove the contaminated material to an authorized site.
9. Finds sections of the Bibliography to be inadequate.
10. Protests the temporary storage of PCB contaminated materials. Finds no provision for the cost of removal and transport of the stored PCBs to an authorized site.
11. Believes the amount of PCB contamination in Waukegan Harbor is below the level considered to be an imminent and substantial danger to public health and welfare.

Q. Written comment by: Ann Olson, Secretary
Newport Community Consolidated School

1. Opposed to any offsite disposal of PCB-contaminated material.
2. Believes landfill will present a health hazard and result in birth defects. Concerned this would require Special Education for many children at additional expense to an overburdened school system.

3. Feels onsite containment should be the action taken:

R. Written comment by: Greg Lindsey, Executive Director
McHenry County Defenders

1. Opposed to landfilling of PCBs that have not been detoxified.
2. Prior to detoxification and disposal, all dredged wastes should be securely stored in a manner that will prevent migration of PCBs into the environment.
3. Would like to see investigation of new technologies rather than continuing to rely on landfills.

S. Written comment by: Donald Freeborn, Executive Director
Waukegan Port District

1. Believes the extensive media coverage has had adverse effects on the harbor image. Wants prompt remedial action taken.
2. There is no evidence to substantiate claims that PCBs are a danger to human life.
3. Would like the selected alternative to completely eliminate the alleged danger without reducing the operating area of the harbor.
4. Concerned that the channel will not be dredged unless a sponsor is found that will provide a suitable disposal site.
5. Feels that if the EPA had taken a more professional, subdued, approach to the problem, sponsor sites for disposal would be more readily acquired.

AUG 12 1983

SUMMARY OF COMMENTS
OMC PUBLIC MEETING
August 3, 1983
Waukegan, IL

A. Speaker: Hugh Thomas, OMC

1. PCB's don't cause any problem - there is no justification for the project. Cited a number of court depositions whereby U.S. EPA witnesses could not prove health related impacts of PCB's. Current U.S. EPA request for a stay in the court proceedings is an attempt to avoid judicial scrutiny.

B. Speaker: Lee Botts, representing herself, but currently working for Northwestern University - School of Urban Studies.

1. Recently attended conference in Ann Arbor, Michigan which showed PCB's are not trapped in sediment, but cycle in ecosystem.
2. Ultimate goal of project should be complete destruction of PCB's - landfilling is not desirable.
3. Temporary storage should be promoted, rather than permanent storage.

C. Speaker: Thomas Gockel, Charter Boat Captain

1. No need for project, PCB's aren't leaving harbor.
2. Questioned the EIS document that was prepared. He said he requested a copy, but couldn't get it. He inferred that there is something in the document which would be detrimental to our purpose, otherwise we would have made it available.
3. Protested the HRS score and indicated the three locations should be scored separately.
4. The bibliography should be expanded so that a more balanced representation is made concerning the health effects of PCB's. He wants data presented which show PCB's don't hurt anyone.

D. Speaker: Lorenz Tronet - Lake County Defenders.

1. Was happy the comment period was extended.
2. Is happy project is going forward, wants PCB's out of lake.
3. Feels study doesn't emphasize the need for protecting health enough.
4. Doesn't like landfills, says they all leak -- thinks additional emphasis must be placed on permanently detoxifying or destroying PCB's.

5. Says project doesn't go far enough - landfilling is not permanent disposal. Therefore, it is not correct to compare it to permanent disposal practices in a cost effective analysis.

6. He wants U.S. EPA to make detoxification possible.

E. Speaker: Name?

1. Believes U.S. EPA should currently relocate emergency water intake before it needs to be used.

F. Speaker: David Miller

1. Wants to build an incinerator near the site for a complete project. ie. PCB's will be destroyed.

2. He says we will be creating a "Love Canal" by encapsulating on the Lake Shore.

3. He says cost figures in FS of \$1,000 yd³ for incineration are too high. He says we could build an incinerator and burn waste for \$50 yd³. He says whole project could be done for \$15-20 million.

4. Doesn't feel project would do the job.

G. Speaker: Norman Proehl - Resident

1. U.S. EPA should not accept a remedy that is not permanent or complete.

2. All plans are not acceptable, allowing some material to remain in the harbor.

3. Encapsulation won't work.

4. Recommends removal with hydraulic dredge to an isolated area, away from harbor.

5. Recommends Johns-Manville property for dewatering and disposal.

6. Clean harbor completely - don't mortgage the future.

H. Speaker: Judy K_____, Lake Michigan Federation

1. Happy we are progressing with a project -- disappointed in result of study since it is only a temporary solution.

2. Clamshell and landfill are old technologies. U.S. EPA should promote R&D projects to promote a complete solution to the problem including PCB destruction.

3. Reference to old U.S. EPA studies showed encapsulation not acceptable.
4. Re-evaluate initial screening in order to more fully evaluate alternatives which were preliminarily screened, but which in fact, would provide long-term solution if technology evolves.

I. Speaker: Bruce Lawson (Waukegan Port Authority)

1. Wants PCB issue resolved.
Wants cleanup in a total manner.
U.S. EPA and Corps of Engineers should coordinate fully.
2. Wants use of new technology to destroy PCB's.
3. Stressed land values and City/Port Authority \$15 million harbor development plan.

J. Speaker: Fred Winter - North Shore Sanitary District

1. Since report discussed the possible discharge of process water to the NSSD, they want us to make sure no contamination would affect their discharge or sludge operations, ultimately affecting public health.

K. Speaker: Walt Porewibski, (representing self)

1. Is worried that importance of implementing project is a function of political pressures on Reagan to implement cleanups trickle down effect.
2. Doesn't want to disturb PCB's for only temporary storage (ie. landfilling).
3. Industrial bond issues should be used to fund the development of a PCB destruction industry in Waukegan. If the systems develop, PCB's from all over the nation could be brought to Waukegan for destruction.
4. Don't move Waukegan's problem to other areas of Lake County.

L. Speaker: Jim Walton - 25 years of dredging contractor work.

1. It is very difficult to drive piles into a clay layer.
2. His company has years of experience in marine dredging work and has equipment to properly conduct the work.

M. Speaker: Roger Harrison - City of Waukegan

1. City was happy with U.S. EPA's decision to implement a project and they felt it was a "sound action".

2. They were concerned about the containment structures, in light of the history of landfills - "Doesn't want to leave a time bomb for future generations.
3. Our proposed solution should not be considered permanent - should only be considered temporary and additional studies should evaluate detoxification/destruction technology.
4. Encouraged U.S. EPA to support evolving technology.
5. Encouraged cooperation between U.S. EPA and businesses along the harbor in order to minimize disruption of commerce.



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

MEMORANDUM

SUBJECT: Breakdown of Public Comments received during
March - April 1984 Public Comment Period on OMC

FROM: Pamela Rekar *PR*
Assistant Regional Counsel

TO: OMC Chronological File

I have reviewed the 226 written public comments received through April 16, 1984. The chart on the following page represents the issues broken down categorically.

In addition to the written comments, 25 comments were taken during the public informational meeting held on March 14, 1984 (see summary attached); two petitions representing 118 people objected to the plan (attached); and an unanimously passed resolution by the Illinois House of Representatives opposing the proposal plan as it related to the use of the Harbor (attached), were received.

From reviewing the comments it appears that the public is almost unanimously opposed to any remedial plan that would jeopardize the Largen business and/or the fishing/recreational activities and incomes derived by the Waukegan Community and the public at large.

cc:	<u>WMB</u>	<u>HQ EPA</u>
	J. Braun	N. Willis
	R. Diefenbach	S. Atkinson
	R. Bartelt	H. Beard
	B. Constantelos	H. Keplinger
	<u>ORC</u>	<u>ORA</u>
	R. Field	Mr. Canovan
	M. Gade	A. Levin
	D. Ullrich	V. Adamkus
	R. Schaefer	
		<u>DOJ</u>
		S. Willie
		E. Stein

TYPE	Slip No. 3 is essential/ surges could result from plan	Leave Larsen in business	Haukejan economy and social recreational benefits would be harmd by the plan	Other business which rely on Slip & Harbor will be harmd	PCBs should be removed offsite	PCBs should be destroyed not contained	Are PCBs are problem/ lets decide the harm, first	Remove the PCBs from the Slip & Harbor; return it to its current use	Is 50ppm the appropriate level	The solution is too temporary
Resident (33)	8	22	14	9	1	1	8	4	2	4
Boat owner/ users (68)	18	60	34	13	9	0	5	13	2	6
Public associations/ entitities/ interest groups (13)	5	10	12	5	3	3	1	5	2	2
Directly affected parties (4)	3	3	3	3	0	0	1	2	1	0
Businesses (33)	9	28	18	11	0	2	1	6	0	4
Citizens, generally (75)	12	51	43	21	8	1	10	19	2	19
Total 226	55(20%)	174(77%)	124(54%)	62(27%)	21(9%)	7(3%)	26(12%)	49(17%)	9(4%)	35(11%)

HILL

engineers
planners
economists
scientists

April 9, 1984

W65928.80

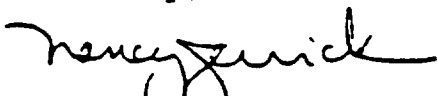
Mr. Jack Braun
Site Project Officer
U.S. Environmental Protection Agency - Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

I have enclosed a summary of the comments received at the March 14, 1984, public meeting concerning the OMC site in Waukegan, Illinois. An overall summary of the major issues is provided, as well as a summary for each individual speaker.

Please call me if you have any comments or questions.

Sincerely,



Nancy Jerick
Planner

cc: Vanessa Musgrave, USEPA Region V
Nancy Tuor, CH2M HILL

PDC118.054.1

Portland Office
2020 S.W. Fourth Avenue, 2nd Floor, Portland, Oregon 97201 503/224-9190 TELEX: 360103 CH2M PTL

U.S. EPA PUBLIC MEETING
OMC SITE, WAUKEGAN, ILLINOIS
March 14, 1984

SUMMARY OF COMMENTS

The purpose of the informational meeting held by EPA on March 14, 1984, in Waukegan, Illinois, was to gather comments and answer questions regarding two additional alternatives being proposed for cleanup of the PCB contamination in Waukegan Harbor. (The comments are summarized in the following pages.) The issues that were predominant in the discussion, based on the amount of attention they received, are listed below.

The issue most frequently addressed (14 speakers) was the effect on Larsen Marine of the proposal to cap Slip No. 3. Some comments pertained to the economic effects of such closure, others to the personal hardship experienced by the Larsens. Several speakers--from individual boat owners to the chairman of the Port District Board--specified how adverse the loss of the marine services and facilities would be.

A second range of commentary focused on the merits of the proposal to cap Slip No. 3. Some reasons offered for opposing this alternative were that it would: (1) increase surge in the harbor from northerly winds, (2) eliminate slip facilities, (3) hamper or curtail harbor development, (4) fail to provide a complete cleanup of the PCB problem, and (5) close down Larsen Marine, as discussed above.

Another subject of concern was the issue of whether PCBs actually pose a threat to public health or the environment, with some individuals asking for evidence and a couple wanting it to be settled in court.

The detrimental effects of the ongoing PCB problem on the economic health of the Waukegan area was noted by several persons, including representatives from the City, the Port District, and Congressman Porter.

Several speakers mentioned or queried the status of the ongoing court case between EPA and Outboard Marine Corporation. Three or four urged EPA to move beyond studies, lawsuits, and evaluations and to act now.

PUBLIC COMMENTS

1. Roger Harrison, representing Mayor Morris and the City of Waukegan, Illinois

This latest plan is unacceptable, unfair to the economy of the community, and unjustifiable environmentally. Leaving residues of 50 parts per million when elsewhere U.S. EPA is suing for failure to clean to one part per million isn't the right approach. The City Council and the citizens of Waukegan want a complete cleanup and complete removal of PCBs.

The City's principal objections are:

- A. The problem has been the subject of various studies and lawsuits since 1976; it's time to decide to clean it up now.
- B. The present proposal fails to clean up the problem and instead passes it on to a future generation. A partial cleanup will reduce costs but not risks. The City couldn't site a hazardous landfill in a flood plain, let alone a lake; why should EPA?
- C. Because this proposal doesn't remove the PCBs from the harbor, Waukegan would retain the poor reputation this problem has brought it.
- D. One of Waukegan's major employers, Larsen Marine, would be eliminated, and the economic effects of that closure would be widespread.
- E. The presence of a PCB dump will discourage future investment in and development of the harbor area.

F. Capping Slip No. 3 would relegate this whole area, in the middle of a large commercial and recreational boating harbor, to permanent nondevelopment.

Superfund was designed to address this type of complex problem. It's time to end the debate and act to remove the PCBs and leave the City of Waukegan with an intact harbor.

2. David Whitmore, Chairman, Waukegan Port District Board

Mr. Whitmore's statement and recommendations represent the unanimous opinions of the Waukegan Port District Board members. The closure of Slip No. 3 without reconstructing it will seriously damage the Port District in two ways: (1) the loss of necessary services provided by Larsen Marine (e.g., day-to-day maintenance for slipholders, use of the winter storage yard); and (2) the loss of a site for relocation of the boat launch ramps, which would significantly affect the Port's Master Plan currently being implemented.

The August 1983 plan called for a reduction of PCB levels to 150 parts per million; the March 1984 proposal lowers the level to 50 parts per million. Why can no one decide what level is safe?

Mr. Whitmore cites EPA's mandate to act without delay in remedying any immediate threat to the environment or human health. He then reviews the history of EPA activities from 1976 to March 1984 and the effects on Waukegan Harbor. The results of EPA's efforts have not led to action but only to the newly proposed expansion of cleanup that would have even greater adverse effect on the harbor and local businesses. The Port did not care for the August 1983 remedy, and actively opposes the one that's proposed now.

Is there any real plan to remove the PCBs? Is there any hard evidence to support the alleged serious toxicity of the PCBs? Mr. Whitmore feels there is some evidence that nature is solving the problem, as indicated by the trend to lower PCB levels in fish. Is this caused by PCB breakdown or dispersion? We don't know.

What we would like to know is if the problem is worse than the remedy, or vice versa. To resolve this question, the Port District is sending a letter to Judge Getzendanner of the Federal District Court of the Northern District of Illinois to hold a hearing expeditiously to determine whether or not the PCBs in Waukegan Harbor are a threat to the environment or to human health. If the court concludes that harm exists, it should make a determination as to what remedy, if any, is practical and feasible. If removal of PCBs is determined to be a practical and feasible remedy, the court should order prompt action.

Mr. Whitmore understands that EPA has agreed to furnish a remedy to the court by May 22, 1984. He desires a speedy trial to resolve the problem-remedy conflict.

3. Lewis D. Clarke, Sr., 1429 Hickory Street, Waukegan, Illinois

Mr. Clarke cites his and others' extensive use of Larsen Marine Services and his fees to the Port District as benefits to the Waukegan economy that will be lost if the April 1984 plan is adopted. He is also concerned that blocking Slip No. 3 will offer much less protection to the boats in the harbor from surf surges during a north, northeast, or northwest wind.

Mr. Clarke questions whether EPA is aware that the proposed work requires a permit from the Illinois Department of Transportation, plus consent from all riparian property owners. It must also be signed by the governor, according to Illinois statutes. His final comment concerns insufficient prior notice of the public meeting; two days' notice is not enough.

4. Betty Lou Reed, Executive Assistant to Congressman John Porter

Speaking on behalf of Congressman Porter, Ms. Reed states that the presentation of additional alternatives requires EPA to address three major concerns before making a decision: (1) the health and safety of Waukegan citizens and those who use the harbor for work or play; (2) the rights of Larsen Marine and other private property owners adversely affected by the PCB problem through no fault of their own; and (3) the impact on the City of Waukegan, whose economy relies on an accessible, usable, natural harbor.

5. Jane Corolis, Waukegan

Ms. Corolis questions whether there are statistics on harmful levels of PCBs in fish and wants to know how much fish consumption would be harmful.

6. Brad West, Waukegan

Speaking as a payer of local, state, and federal taxes, Mr. West regrets that so much money is being spent in Waukegan when the latest proposal isn't going to do the job.

7. Mary Goodly

Ms. Goodly would like to verify that a chromatographic analysis of a fossil filter of a Waukegan resident sent to Ms. Carlson on August 14 has been received.

8. Mike Foster, Waukegan

Are there any documented cases of any ill effects from the problem in the lake, anything that can be attributed to this possible problem?

9. Hugh Thomas, Associate General Counsel, Outboard Marine Corporation, Waukegan

At the EPA's August 1983 meeting, Outboard Marine Corporation presented extensive evidence, based on EPA's own statements, that there is no immediate or potential threat to the environment or human health, and consequently that no remedial action is necessary. These comments have never been publicly addressed by EPA nor have EPA experts produced any evidence to justify past and current proposals. Why, then, has another meeting been called 7 months later to propose an even more drastic project on the same site?

EPA does not expect to commence remedial action until 1986, which Mr. Thomas concludes is proof that the PCBs pose no immediate threat and that EPA has no intention of justifying their actions, factually or legally.

The latest proposal, to dredge even more of Waukegan Harbor at even greater expense, coincides with a renewed request by EPA to the Federal Court in Chicago to dismiss its case against Outboard Marine Corporation. According to Mr. Thomas,

EPA's intention is to avoid judicial scrutiny of its proposals and conduct regarding the alleged need for remedial action.

Outboard Marine Corporation has repeatedly requested a judicial hearing on the alleged PCB problem to obtain an impartial resolution. It is unfair for EPA to sue OMC in 1978, requiring OMC to defend this action for 6 years, and then attempt to circumvent the judicial system when it cannot meet the burden of proof that PCBs are harmful. It is also unfair to the residents and businesses of Waukegan to declare that PCBs are a problem but be unwilling or unable to prove such a problem exists.

Waukegan citizens and OMC are entitled to evidence from EPA that it is acting in accordance with the facts and the law, in a reasonable manner. OMC will continue to challenge unsupported and unjustified actions and proposals by EPA. This matter must be resolved by the courts.

10. Ron Griesheimer, Counsel, Larsen Marine Corporation

Mr. Griesheimer believes that the statement made on behalf of Outboard Marine Corporation by Mr. Hugh Thomas raises several questions.

- A. Is there any judicial decision anywhere in the United States that has found that PCBs are a contaminant?
- B. Are there any other lawsuits pending similar to the one with OMC that focus on the issue of whether PCBs are a contaminant?
- C. Are there any pending lawsuits as long term as the OMC case?

- D. Does EPA intend to go before Judge Getzendanner and drop their lawsuit in May?
- E. Was a firm and definitive statement of action submitted by the Chicago Regional Office of EPA to Washington, D.C.?
- F. What was recommended by the regional office as a solution? Was it rejected?
- G. Does the \$2.7 million difference between the projected costs of the August proposal and the new proposal anticipate the loss suffered by Larsen Marine, the City of Waukegan, and the Port Authority? Or will there be an even greater amount of money involved?

11. Paul Janensch, Ingleside, Illinois

As a long-time user of the harbor and Larsen Marine Service, he does not wish to see such facilities and service end. As a taxpayer, he is opposed to spending \$17 to \$20 million without knowing that it is going to correct anything.

12. Joseph Decello, representing the membership of the Waukegan Yacht Club

Mr. Decello read a prepared statement, a resolution passed by the board of directors, which opposes the proposed action for the following reasons.

- A. It will increase wave action in the harbor, already increased by the closure of Slip No. 2.
- B. It will eliminate dockage of yachts at Slip No. 3.

- C. It will deprive yacht club members of full pump-out facilities, winter storage, and repair services now provided by Larsen Marine.

A certified copy of this resolution is to be filed with the U.S. EPA.

13. Steve Lapish

Mr. Lapish represents Larsen Marine, a dredging company out of Waukegan Harbor. He opposes the current proposal because it will cause a larger surge in the harbor. He also mentions that the closure of Slip No. 2 caused a larger surge. He believes this latest approach is wrong.

He would like to know whether EPA is turning this job over to the Army Corps of Engineers for the design. Will the design be EPA's or the Army Corps of Engineers'?

14. Mike Vossen (speaking without formal recognition from the chair)

What happened to the idea of sheeting the harbor from Slip No. 1 across to Outboard Marine, pumping and dredging it, and hauling the material away in trucks or burning it? He would like it to be disposed of permanently.

15. Dr. Edward Leslie

Since he was absent earlier, he would like to know if anyone had spoken in favor of filling up Slip No. 3.

16. William Fisher

Mr. Fisher would like to see a show of hands to indicate how many think that the EPA has the answer to this problem and are going about this in the correct manner, and how many are opposed. (Request carried out as a show of opinion, not a vote.)

17. Lewis Clarke, Jr.

Mr. Clarke endorsed the statements of others who cited the importance of retaining Larsen Marine Services. He is specifically concerned with a dramatic increase in harbor surge as a result of altering Slip No. 3. Such closure will make the harbor unsuitable for commercial and pleasure boats. He raised the following questions.

- A. Why does the cofferdam or bulkhead, which holds back the contaminants, cut off the Larsen property when none of OMC's property is affected?
- B. Has EPA been approached by Elgin Joliet and Eastern Railroad for use of some of their property for disposal of dredged material from the harbor?
Mr. Clarke prefers a removal option rather than the slip closure proposal.
- C. Why has the earlier proposal to provide an alternate to Slip No. 3 on OMC property been abandoned; or why is an alternative being considered that doesn't include alternate slip facilities?
Mr. Clarke urges consideration of such an alternative.

He strongly urges that some other site than the harbor be used for disposal; he does not want to live in a chemical dump.

18. Walter Porembski

Mr. Porembski is concerned about the disposal of the "hot stuff" as specified during the August 1983 presentation: Is it still going to be hauled away, or will it be buried in Slip No. 3?

He believes that the conclusions reached in the Waukegan Harbor PCB feasibility study are short-sighted and should not be implemented. Current information disputes the conclusions and the plan of action--technically, economically, and politically.

- A. Chemical landfills leak and are not a permanent solution.
- B. The only goal must be complete destruction of the PCBs, and the technology to accomplish that task is emerging.
- C. The new slip being proposed should be considered a temporary alternative until the technology for permanent destruction of PCBs is achieved.
- D. Transfer of any portion of the PCBs to an offsite landfill will be a waste of money and will further complicate the task of complete PCB destruction.
- E. The money saved by not pursuing a landfill option would be better spent developing a PCB destruction plant.

- F. Waukegan should capitalize on its misfortune by making itself the center of a PCB destruction industry. The harbor is already zoned industrial and is accessible by rail and water.
- G. There is no need to rush into cleaning the harbor. Industries based in the harbor are declining (e.g., cement and plasterboard, Johnson Motors); additional harbor slips are developing in Waukegan Harbor and marinas elsewhere; and Larsen Marine, with its unique services, could relocate anywhere.
- H. The pressure to spend the Superfund money right now (i.e., summer 1984) should be resisted. Don't spread the toxic mess to a nearby landfill; contain the PCBs at Waukegan Harbor until they can be completely destroyed.

[Mr. Lapish spoke up from the audience to contradict Mr. Porembski's comments about the decline of the cement and plasterboard industries with specific examples. He added that a lot of dock space would be displaced, and a lot of commercial traffic uses Waukegan Harbor.]

19. Jackie Jones, speaking on behalf of her husband

The harbor area is a resource and an important part of our environment that the EPA should fight to protect not destroy. To replace Slip No. 3 with a concrete slab would give current and future generations something they neither need nor want. Any decrease in size or destruction of the harbor is unacceptable.

20. Arthur B. Atkinson, 12643 West Glen Flora, Waukegan, Illinois

Mr. Atkinson reviews the history of his business in the harbor since 1969 and his unsuccessful effort in 1973, together with the Illinois Conservation Department, to hold fish in three different locations in Waukegan Harbor. Although he reported the problem to the EPA, he didn't discover the real problem until the PCB contamination was disclosed in 1976. He and his wife have invested 7 or 8 years of work, only to have it go down the drain, and he expresses concern for the Larsens whose residence and business in Waukegan have been much longer.

21. Marvin Ball, boat owner and representative of 3,000 Salmon Unlimited

Mr. Ball would like to know the next court date for EPA and OMC, and whether the FDA will appear to provide expert testimony on the subject of PCB contamination. He would also like to know why the idea of a cement cap is being revived now when it was rejected 2 years ago on the basis that during run-off the PCBs would be able to penetrate the clay layer and enter the water. Isn't the fact that the bottom is going to be "open" still a problem?

22. Ed Urban

At the rate the alternatives are being suggested, eventually the harbor will be blocked off and finally they will cap Waukegan. It would make just as much sense to pay the media not to talk about the problem, and in 2 years it will go away.

23. Elaine Ball

Ms. Ball would like to know if EPA will support the families whose livelihood is affected by the dredging, specifically Larsen Marine and the charter boat operators.

24. Bob Colpetzer, Waukegan Charter Boat Association

Mr. Colpetzer represents a group of 25 charter boats. There are 50 charter boats active in Waukegan Harbor, and the closure of Larsen Marine services will directly affect all of them. They will be virtually driven out of business if Larsen closes.

25. Jerry Larsen, Larsen Marine

Mr. Larsen stated that, contrary to what was said earlier by Mr. Porembski, there is no place else in the state of Illinois where their business could relocate and provide the same services at it does now.

Ms. Vanessa Musgrave
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

March 27, 1984

MAR 30 1984

Dear Ms. Musgrave:

We, the undersigned, wish to make known our serious objections to the current EPA plan to control the PCB problem in Waukegan Harbor.

To those of us that utilize the Illinois shores of Lake Michigan, the loss of Larsen Marine Service, Incorporated would be terrible. This organization has provided a valuable service whose loss would be very detrimental in terms of not only convenience but also safety. We therefore strongly urge the EPA to find other means of controlling this problem without jeopardizing the future of this most valuable service, along with the jobs of many who live in the Waukegan community and have long been employed by this firm.

We are also concerned that the EPA would sacrifice a portion of our precious lakefront resource to create a permanent toxic waste dump that could be better placed elsewhere.

Further, we feel that this will place additional hardships on the Waukegan Port Authority and the City of Waukegan in its effort to develop the Waukegan harbor area for recreational and commercial boating.

Sincerely,

Name

Address

Mark Wentz

Li Bucher

Byron K. Kuehn

2602 So Spring St

James G. Gattis

3329 S. MacArthur St. Ill

Don G. Gattis

6325 N. Sheridan Rd Chicago

Ann Whitby

6818 Harvard Ave Woodridge, Ill

Arthur L. B. J.

3410 N. Lake Shore Dr Chicago, Ill

Louise J. Kelly

1432 N. Halsted St Chicago, Ill

John K. Kuehn

2032 N. Central Chicago, Ill

E. J. J.

131 N. 11th St Chicago, Ill

Eugene L. B. J.

3410 Lake Shore Dr Chicago, Ill 60657

James J. J.

210 N. Halsted St Chicago, Ill

MAR 30 1964

EPA PETITION

Name

Address

1105B SPEAK - 3870 CHARMIL LN - ST. JOE, MI
 All Model - 2131 Hudson Chgo IL 60614
 Maxine Mikel 2131 Hudson Chgo IL 60614
 Ed Lull - 6754 W. 24th St. Burrage IL 60402
 My Paper 1125 Linden Ave. Oak Park, Ill.
 Mr. Walter 7441 N. Rogers Chicago IL 60626
 But Payson 9116 Oleander Marten Grove, IL 60053
 Mary Eliza 2007 N. Sedgwick Chgo IL 60614
 Carl Harris 155 Clinton Place River Forest IL 60088
 John G. Peterson 1708 Lake Wilmette IL 60091
 Bekke Chylock 400 E. Randolph Chicago 60601
 Eugene W. Huron 155 N. Harbor Dr. Chicago 60601
 Herbert Margot 1042 W. Dixon Chgo 60613
 Vincent Rogowski 465 W. Danvers Dr. Wood Dale IL 60191
 Ed Harris 1058 Randolph Palatine, IL 60067
 Goldstein 1730 E. 1st Ave Northbrook IL 60062
 Maxine H. Hunt 3600 L.S.D. Chgo 60613
 J. Lynn 411 BRIM Chgo, Ill 60657
 J. D. 4422 N. FRANCISCO CHICAGO, IL 60625
 J. S. McFarrey 1131 - 44th St. West Forest 60305
 Jeannette Hansen 2428 N. Lincoln Chgo, IL 60614
 Alfred J. Barby 677 WRIGHTWOOD CHICAGO, IL 60614
 E. H. H. 120 Glen Dale Rd. Homewood, IL 60430
 Mary J. Howard 400 E. Randolph Chgo, Ill 60601
 Susan J. Hayes 400 E. Randolph Chgo, Ill 60601
 Monte C. Coates 120 Glen Dale Rd. Homewood, IL 60430

MAR 30 1964

Address

Name

EPA PETITION

Page 3 of 3

1

1

Gerald H. Thorne

6926 Blue Sky Ave. Wash, IL

Henry K. Kasper

440 S. Ogden St. Mendota

James P. B. B.

180 Dearborn Chicago, IL

James P. B. B.

150 Dearborn Chicago, IL

James P. B. B.

350 Dearborn Chicago, IL

James P. B. B.

150 Dearborn Chicago, IL

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EPA PETITION

MAR 30 1964

Name

Address

Henry J. Graves 4221 N Paulina Chicago 60613
John G. Binkley 5909 N. Central Park, Chicago 60655
George & Ann LeFores 250.663 Harvard Dr.; Chicago 60655

67



61ST DISTRICT
EX OFFICIO MEMBER
ALL HOUSE COMMITTEES

JOHN S. MATIJEVICH
ASSISTANT MAJORITY LEADER

April 9, 1984

RECEIVED

Mary Ellen Lynch
Regional Office
U. S. Environmental Protection Agency
230 S. Dearborn
Chicago, IL 60604

APR 11 1984

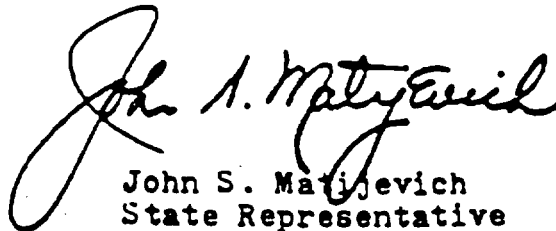
EPA REGION 5
OFFICE OF REGIONAL
ADMINISTRATION

Dear Mary Ellen:

Please be advised that the Illinois House of Representatives adopted unanimously the enclosed resolution on April 5, 1984.

Kindest regards.

Sincerely,


John S. Matijevich
State Representative

JSM:djh

Encl.

LYNCH
EA
D.L.G.
M. C. B. S. S.
W.H.D.
O.L.C.
O.P.P.
V. M. S. C. S.
F. R. C. S.

STATE OF ILLINOIS
EIGHTY-THIRD GENERAL ASSEMBLY
HOUSE OF REPRESENTATIVES

House Resolution No. 795

Offered by Representatives Matijevich - Churchill, V.F. Frederick,
Peterson and Pience

WHEREAS. The U. S. Environmental Protection Agency has held public hearings on a new proposal regarding the cleanup of polychlorinated biphenyls (PCB) from the Waukegan Illinois Harbor; and

WHEREAS. The new proposal would close the North one-quarter to one-third of the existing harbor with a cofferdam and all of the dredgings including PCBs would be encapsulated within this area; and

WHEREAS. The latest U. S. Environmental Protection Agency plan would totally deprive Larsen Marine Service from any access to Lake Michigan, as well as partially depriving U. S. Gypsum and Falcon Marine to water access in the harbor; and

WHEREAS. The proposal would triple the size of a PCB landfill within Waukegan Harbor; and

WHEREAS. The proposal would impose a massive hardship on the Waukegan Port District and the City of Waukegan in their cooperative endeavors to implement a sound harbor development plan; and

WHEREAS. The existing harbor size is being tripled by the soon-to-be completed harbor expansion project which will lead to massive growth; and

WHEREAS. The U. S. Environmental Protection Agency plan delays the cleanup of PCBs in Waukegan Harbor and seriously jeopardizes the economic progress of a well-thought Lake Michigan master plan being developed by the cities of Waukegan and North Chicago and the Waukegan Port District; therefore, be it

RESOLVED, BY THE HOUSE OF REPRESENTATIVES OF THE EIGHTY-THIRD GENERAL ASSEMBLY OF THE STATE OF ILLINOIS, that we go on record as opposing the United States Environmental Protection Agency proposal which would close a substantial portion of Waukegan Harbor making it a landfill with no alternatives or substitutes as originally proposed for the lost water area in Waukegan Harbor; that we believe that the latest proposal will seriously undermine the harbor development plan under way by the Waukegan Port District; and that we believe the U. S. Environmental Protection Agency plan would have an adverse economic impact on the economic stability and progress in the community; and be it further

RESOLVED, That a suitable copy of this preamble and resolution be delivered to the Regional office of the U. S. Environmental Protection Agency.

Adopted by the House of Representatives on April 5, 1984.

Michael J. Madigan

Michael J. Madigan, Speaker of the House

John F. O'Brien

John F. O'Brien, Clerk of the House



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

SUBJECT: Application for Approval of an Alternate Disposal Method to be used for Dredge Materials that Contain PCBs at the OMC - Waukegan Harbor Hazardous Waste Site

FROM: Richard Bartelt *[Signature]*
Supervising Environmental Engineer
Remedial Response Branch

through

Karl J. Klepitsch, Jr.
Chief, Waste Management Branch

TO: Valdas V. Adamkus
Regional Administrator

This application is being made pursuant to 40 C.F.R. Part 761.60(a)(5).

Background

The Outboard Marine Corporation (OMC) Waukegan Harbor Hazardous Waste Site is the subject of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Action. The Remedial Response Branch, after much discussion with our Headquarters counterpart, intends to recommend a remedial cleanup plan which includes the construction of two on-site containment structures which would contain PCB dredge material and soils with concentrations ranging from 50 to 10,000 ppm.

As is indicated at page 33 of the attached OMC - Technical Documentation, over fifty treatment alternatives and technologies were reviewed before selecting a combination on-site and off-site disposal plan. The Feasibility Study (copy attached) went out to public comment in July, 1983 and again in March, 1984.

It is our belief that the on-site containment cells, in conjunction with the other alternatives recommended for implementation at the OMC site represent the appropriate CERCLA cleanup measures to assure adequate protection to the health and environment.

Supporting Documentation

This document, in conjunction with the documents referenced above, are submitted as the information required pursuant to 40 C.F.R. Part 761.60 (a)(5) to justify an alternate disposal method for the PCBs at the OMC Site.

Technical Description of Waste Transfer and Containment Structure - OMC Parking Lot and Crescent Ditch/Oval Lagoon Sites

A. General Introduction

The proposal for solving the PCB contamination problem in Waukegan Harbor and the North Ditch Area involves the construction of two on-site containment structures. The first on-site containment structure is to be built in the area of the crescent ditch/oval lagoon. This cell will contain PCB contaminated material excavated from the North Ditch. The purpose of the excavation is to install the bypass sewer. The second containment cell is proposed to be constructed in the parking lot area and will contain dredge material from Waukegan Harbor. The parking lot is already contaminated with similar material. Each site will be discussed separately, below.

1. Crescent Ditch/Oval Lagoon containment cell.

U.S. EPA proposes to construct a storm bypass sewer in the North Ditch. In order to construct the sewer, PCB contaminated dredge spoil will need to be excavated from the ditch. The cell would be constructed in the area of the current crescent ditch/oval lagoon and would be used solely for this project. Upon placement of the excavated North Ditch material, the cell will be capped and sealed in place.

a. Use

The use of the site is for the one time disposal.

b. Soils

The site is located close to Lake Michigan, the dominant geologic influence of the site. The site contains 30 feet of sand and contaminated muck soils. It is underlaid by 75 to 100 feet of thick clay glacial till. This is shown to be an effective barrier to all but the highest concentrations of PCB's which currently exist on the site.

c. Synthetic Membrane Liners

Since the area is already contaminated, no synthetic membrane liners are proposed for use.

d. Slurry walls

Construction of the containment structure will rely on the use of two feet thick slurry trenches to block the horizontal migration of contamination of excavated dredge material from the North Ditch, as well as inplace containment of existing contamination. Approximately 19,500 yd³ of soil containing 3,400 lbs of PCB's with concentrations between 50 to 5,000 ppm in the east-west portion of the North Ditch would be placed in the proposed containment cell. The North Ditch soils would be dewatered in place with well points, prior to excavation. The crescent ditch/oval lagoon area is currently contaminated with soils in excess of 10,000 ppm PCB. It is proposed to remove 5,500 yds³ of the most highly contaminated material, prior to creating the containment cell. The slurry wall will have a permeability equal to or less than 1×10^{-7} cm/sec. It

shall be constructed of a material that is chemically resistant to the PCB's in their current condition. The slurry walls will extend from their contact with the clay cap downward and extend to a depth which penetrates the glacial till to a depth of 5 feet.

e. Hydrological Conditions

The bottom of the landfill is hereby defined to be the top of the glacial till since this is the depth of the existing contamination. This penetrates the historical high groundwater table. The slurry walls, combined with the fill activities will cut off the connection between the site and the standing or flowing ground or surface water.

f. Flood Protection

The landfill site is above the 100 year floodplain, except for the crescent ditch and oval lagoon. These surface flows will be rerouted through a sewer. The finished elevation increase would be 10 feet above the current grade and would further safeguard the site against flooding.

g. Topography

The landfill site is very flat and experiences minimal erosion. It is in an area of "beach building", precluding wave action erosion. The North Ditch drainage crosses the proposed site. This is mainly a manmade drainage ditch, which is highly contaminated with PCB's. The drainage area will be rerouted with a sewer, the surface will be graded to direct flows to sewer manholes. The new drainage sewer will be routed around the containment cell.

h. Monitoring Systems

Extensive core data exists on the current condition of the site. Additional soil and water samples can be analyzed to serve as a baseline for further monitoring.

i. Groundwater Monitoring Wells

Eight groundwater monitoring wells will be installed around the site. Groundwater is currently moving very slowly eastward toward Lake Michigan, but flows may be altered slightly by slurry trench construction.

j. Leachate Collection

An internal pump and drainage system will be installed at the time of containment cell construction. Should unacceptable levels of PCB's be detected in the monitoring wells surrounding the site, water levels within the cell can be lowered, causing a net inflow into the cell. The water would be treated and discharged to the lake. Water in both the monitoring and leachate system would be analyzed for PCB's, pH, specific conductance, and other chlorinated organics.

The pump and drain system would be composed of lateral perforated pipe, a sump and vertical cased risers.

k. Chemical Waste Landfill Operations

This chemical waste landfill will be operated for the one-time disposal of PCB contaminated dredge material from the North Ditch excavation. The soils will be dewatered in place, by well points, prior to excavation, the dried material will be transported to the site by truck or front end loader. The vehicles will be unloaded within the the slurry wall areas. The material will be spread and compacted on the site. The amount of exposed PCB contaminated material will be kept to a minimum at all times. Clean dirt, organic sludges, dust control agents, or plastic liners will be used to minimize volatilization. Surface drainage from rain, etc., will be channeled to a sump and treated through a 200 gpm carbon treatment plan and discharged. When all material is in place it will be covered with a fabric liner. The cell will then be capped with three feet of clay, compacted to a permeability less than 1×10^{-7} cm/sec, topped with soil and planted with grass. Long term operation and maintenance is the responsibility of the State of Illinois in conformance with the CERCLA Legislation.

2. Parking Lot Containment Structure

The proposal for solving the PCB contamination problem in Waukegan Harbor calls for utilization of a hydraulic dredge to suck PCB contaminated sediment from the bottom of slip #3 and the upper harbor area. A dewatering lagoon will be constructed on OMC property to dry the dredge spoils. The contaminated dredge spoil will be pumped to the dewatering lagoon. Excess water will be continuously decanted, run through a water treatment plan, and discharged back to the harbor. The sediment will be mixed with a Riverine Utility Craft (RUC). This will channelize the sediment and aide drying. Once the waste is dry, it will be removed by dragline, on a periodic basis for ultimate disposal on the OMC parking lot area. This section will describe the current condition of the parking lot and plans for developing the on-site containment cell.

Current Conditions of Proposed Cell Site

The currently recommended location for the containment cell is in the OMC parking lot. This is shown in Figure 1. Extensive core data has revealed that the parking lot is currently contaminated with PCB's exceeding 5,000 ppm in concentration the area for the containment cell is irregularly shaped, but is approximately 350' wide by 800' long. The proposed disposal site is partially paved with asphalt but is in a deteriorated condition. The eastern part is composed of beach sand. The site is composed of 25-30 feet of contaminated beach sand overlaying 75 to 100' of glacial till. Groundwater is close to the surface and fluxuates with the level of Lake Michigan. The site is above the one hundred year flood plain.

a. Use

The use of this site is for the one time disposal of dredge material originating from Waukegan harbor and the inplace containment of approximately 277,700 lbs of PCB's. The southwest corner of the parking lot currently contains PCB's in concentrations ranging from 50 to 5,000 ppm concentrations of the dredge spoils to be disposed from the Waukegan Harbor range from 50 to 10,000 parts per million. The majority of the dredge spoils contain under 500 ppm. Approximately 40,000 cubic yards of dredge material would be disposed in the containment cell.

-3-

b. Soils

The site is located close to Lake Michigan, the dominant geologic influence of the site. The site contains 25-30 feet of beach sand, but this is already contaminated by PCB's from pre-TSCA disposal activities. The site is underlaid by 75 to 100 feet of glacial till. Coring studies have demonstrated this to be an effective barrier to all but the highest concentrations of existing contamination. This soil has a high clay and silt content.

c. Synthetic Membrane Liners

Currently, no synthetic membrane liners are proposed for use.

d. Slurry Walls

Construction of the containment structure will rely on the use of two feet thick slurry trenches to block the horizontal migration of contamination. The slurry wall will have a permeability equal to or less than 1×10^{-7} cm/sec. It shall be constructed of a material that is chemically resistant to the PCB's in their current condition. The slurry walls will extend from their contact with the clay cap downward and extend to a depth which penetrates the glacial till to a depth of 5 feet.

e. Hydrologic Conditions

The bottom of the landfill is hereby defined to be the top of the glacial till since this is the depth of existing contamination. This penetrates the historical high groundwater table. The slurry walls will hydraulically cut off the connection between the site and standing or flowing groundwater or surface water.

f. Flood Protection

The landfill site is above the 100 year floodplain and the proposed 14' increase in surface elevation shall provide sufficient capability to direct surface flows away from the site. This includes a 24-hour, 25-year storm.

g. Topography

The landfill is currently very flat and experiences minimal erosion. It is in an area of "beach building", precluding wave action erosion.

h. Monitoring Systems

Extensive core data exists on the current condition of the site. Additional soil and water samples can be analyzed to serve as a baseline for further monitoring.

i. Groundwater Monitoring Wells

Eight groundwater monitoring wells will be installed around the site. Groundwater is currently moving very slowly eastward toward Lake Michigan, but flows may alter slightly because of slurry trench construction.

j. Leachate Collection

An internal pump and drainage system will be installed at the time of the containment cell is constructed. Should unacceptable levels of PCB's be detected by the monitoring system, water levels within the cell can be lowered, causing a net movement into the cell. The water would be treated and discharged to the lake. Water in both the monitoring and leachate system would be analyzed for PCB's, pH, specific conductance, and other chlorinated organics. The pump and drain system would be composed of lateral perforated pipe, a sump and vertical cased riser.

k. Chemical Waste Landfill Operations

This Chemical Waste Landfill will be operated for the disposal of PCB contaminated dredge spoil from one project. The dredge material will be dried in a dewatering lagoon. The dried material will be removed by dragline and transported by truck to the proposed disposal site the trucks will be unloaded within the slurry wall area and the material piled and compacted on the site. The amount of exposed surface area of PCB material will be limited to the greatest extent possible. Clean dirt or organic material such as dried sewage sludge shall be spread over new areas to reduce volatilization. Surface drainage from rain, etc., will be channeled to a sump and treated through a 200 gpm carbon treatment plant and discharged. In addition to the dredge spoil, and upon completion of drying and disposal activities, contaminated dewatering lagoon material will be disposed on the site. This will include approximately 25,000 cubic yards of lagoon bottom and berm material and the fabric liners. When all this material is in place, the cell will be capped with three feet of clay, compacted to a permeability less than 1×10^{-7} cm/sec, topped with soil and planted with grass. Long term O&M is the responsibility of the State of Illinois in conformance with CERCLA Legislation.

Technical, Environmental, and Economic Considerations Indicating that Disposal in an Incinerator or Chemical Waste Landfill is not Reasonable and Appropriate

Although technically and to some extent, environmentally, it may appear that the PCBs at the OMC Site should be disposed of in an incinerator or chemical waste landfill, economic considerations strongly suggest that neither an incinerator or chemical waste landfill are reasonable or appropriate for the PCBs at the OMC Site.

A. Review of Incineration

CH2M Hill, the EPA contractor that prepared the Feasibility Study, (attached) eliminated incineration early on in its review of possible disposal methods. Highlighted, the reasons are as follows:

- ° Permitting and construction of an on-site incinerator would probably take 7 or more years, well beyond the target date for project completion.
- ° No existing mobile incinerators that have been demonstrated to conform to the requirements of 40 C.F.R. Part 761.70 were identified during preparation of the Feasibility Study.

- ° At the time of the Feasibility Study, there were no licensed commercial PCB incinerators in the United States with sufficient capacity to complete the PCB destruction in a reasonable time.
- ° Costs for hauling to and disposal in a PCB-approved landfill were less than cost for incineration.

If incineration were to be chosen, the multiple-hearth incinerator would likely be the method of choice for the OMC Site. A review of various available PCB destruction systems made during the preliminary screening indicated that incineration offered the only potentially available, feasible means of PCB destruction for the contaminated soil and sediment at Waukegan. Costs were estimated to be on the order of \$500 to \$1,000 per cubic yard of contaminated sediment and soil. The PCBs would need to be delivered in 15- or 30-gallon drums. The cost of incineration varied from \$60 to \$80 per drum regardless of drum size. That equated to a cost of \$425 to \$575 per cubic yard, assuming 30-gallon drums 95 percent full. The drums themselves would cost about \$22 each, equating to about \$150 per cubic yard for drums. Transportation costs must be additionally added, dependent upon the location of the incinerator.

For comparison purposes only, a rough estimate of the cost of incineration of all PCBs and PCB-contaminated sediment and soil at the OMC Site was made based on the Feasibility Study cost estimated for excavation and disposal alternatives. The estimated cost of complete excavation and disposal in a PCB landfill of all sediment and soil with PCB concentrations in excess of 50 ppm was about \$64 million. A cost of \$50 per cubic yard for transportation and disposal was used to develop this estimate. Thus, the total transportation and disposal cost for 260,000 cubic yards of contaminated material (including dewatering lagoon lining and volatilization control material) would be about \$13 million. The cost for incineration of 260,000 cubic yards of material would range from about \$130 to \$260 million (using a range of \$500 to \$1,000 per cubic yard). Adding this to the cost for excavation and related activities gives a total of \$170 to \$300 million for excavation and incineration of sediment and soil with PCB concentrations of 50 ppm or more.

On-site incineration would reduce transportation costs, but would increase incineration costs by increasing the capital recovery cost per ton incinerated (unless the incinerator became a permanent disposal facility.) Offsite incineration would be expected to raise transportation costs while lowering incineration costs. Since this is an order of magnitude greater than the on-site containment alternatives, it was eliminated from further consideration.

To include the 122,000 cubic yards of Lower Harbor sediments containing 10 to 50 ppm PCBs would add an additional \$65 to \$125 million (using the same approximate estimating method), for a grand total in the range of \$235 to \$425 million for excavation and incineration of all sediment and soil with PCB concentrations of 10 ppm or more.

At an incinerator with a capacity of about 20,000 gallons per day, it would take over 6 years to destroy all OMC sediment and soil with PCB concentration of 50 ppm or greater. This assumes that the incinerator is operated 7 days a week, accepting not other waste, and experiencing no down time. Destroying the OMC soils with concentrations of 10 to 50 ppm under the same assumptions would take nearly 3 1/2 years.

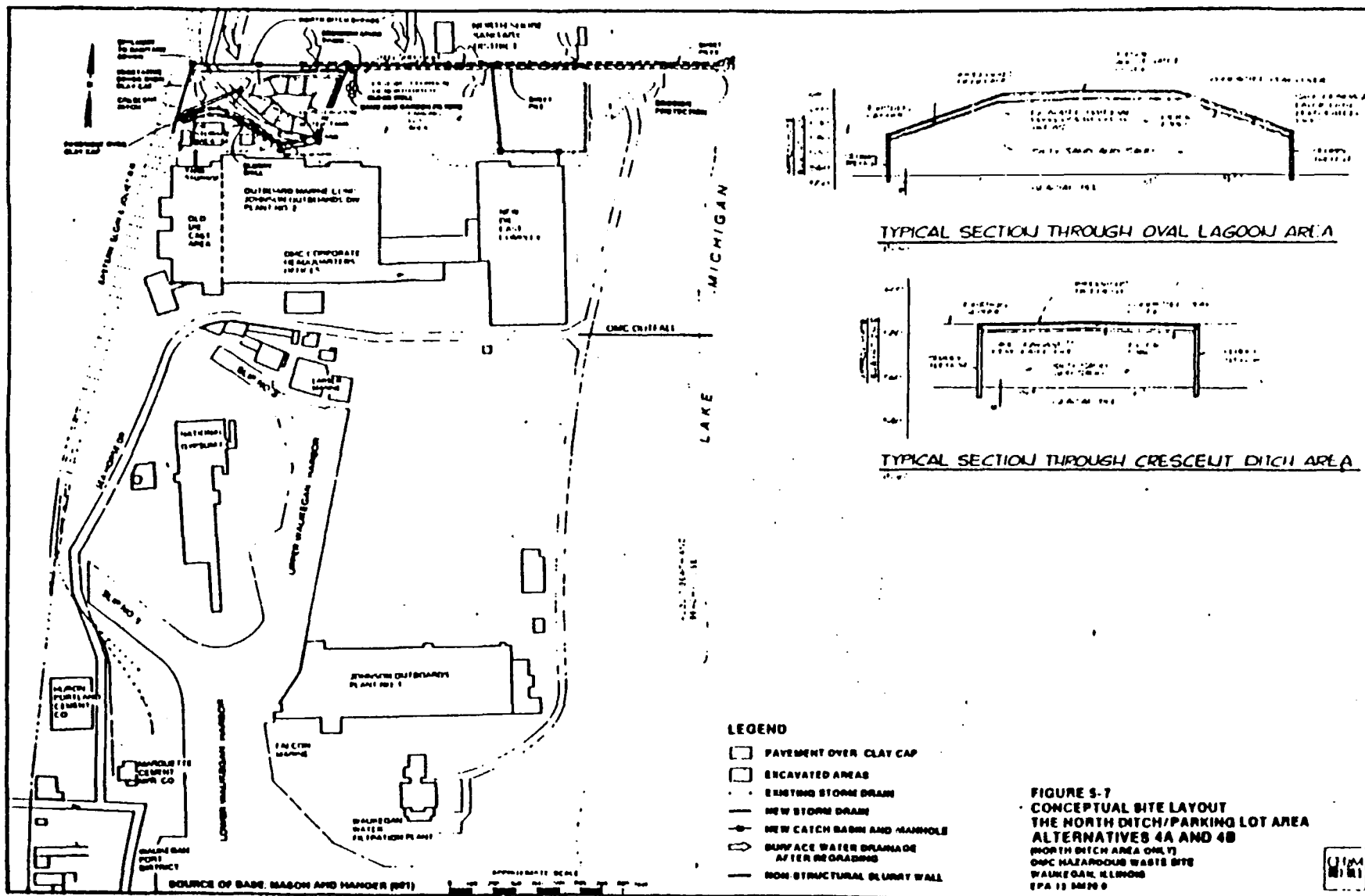
B. Review of Chemical Waste Landfill

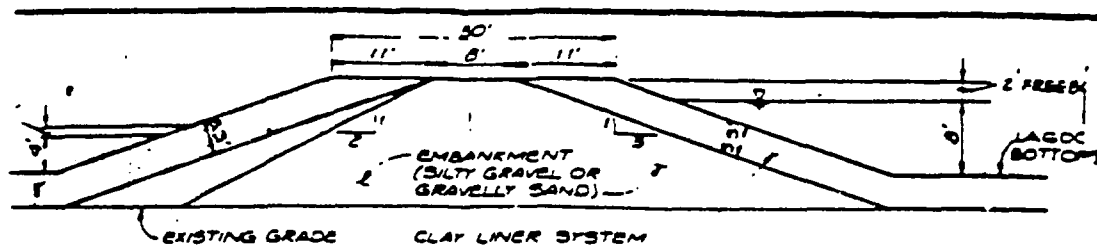
The attached Feasibility Study discusses alternatives for the complete removal of PCBs and PCB-contaminated soils and sediments (greater than 50 ppm) from the OMC Site to a licensed chemical waste landfill. See Alternatives: 2B (Slip #3) pg 5-1; 2B (Upper Harbor) pg 5-18; 1 (Parking Lot) pg 5-39; and 3 (North Ditch) pg 5-45. Under these alternatives the sediments from Slip #3 and the Upper Harbor would be dredged, fixed and disposed; the soils in the North Ditch area would be excavated, fixed and disposed; and the soils in the Parking Lot would be excavated and disposed. The disposal site contemplated in the Feasibility Study would be a licensed chemical waste landfill. The total estimated cost for such an offsite disposal is \$74,890,000. The availability of adequate capacity for the volume of sediment estimated to be generated from this project in a chemical waste landfill must be raised. Also the question if this capacity, if available, might not be better used for more highly contaminated material from other sources. There are certain risks which must be considered when evaluating onsite containment as opposed to shipping large volumes of toxic dredge spoils over long distances.

Conclusion

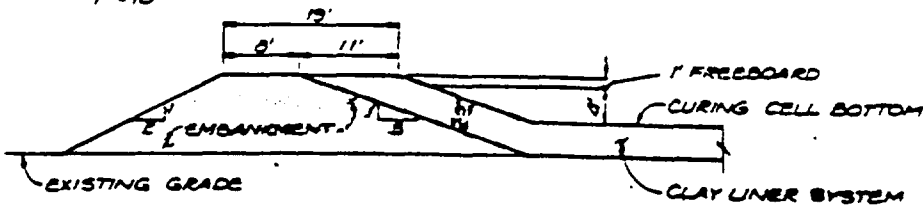
In light of the high cost of the incineration and chemical waste landfill alternatives for the OMC Site, both in terms of dollars and other CERCLA actions which would have to be foregone, we decided to consider other remedial alternatives. The proposed remedial plan is a combination of on-site and offsite control of PCBs from the OMC Site. See OMC - Technical Document pg 47. Over 92% of the PCBs currently in the Harbor will be removed and disposed of offsite. Over 56% of the PCBs currently in the North Ditch/Parking Lot area will be removed and disposed of offsite. The remedial plan for the OMC Site is consistent with CERCLA and the National Contingency Plan.

We submit that the containment cells described in this document are consistent with the intent of the Toxic Substances Control Act and warrant approval as an alternate disposal method pursuant to 40 C.F.R. Part 761.60 (a)(5).

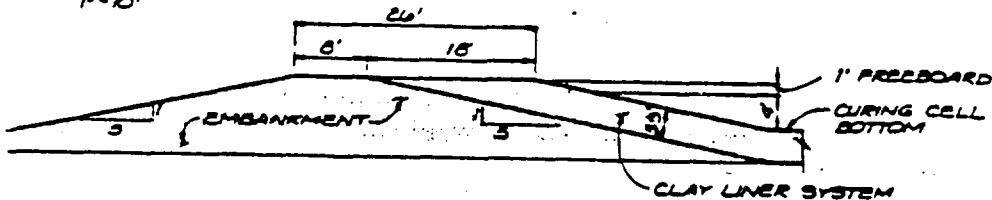




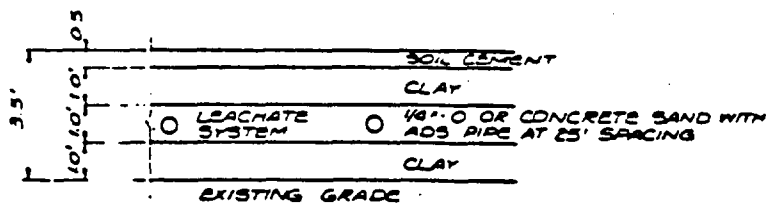
CLAY LINER SYSTEM
TYPICAL LAGOON SECTION
 1" = 10'



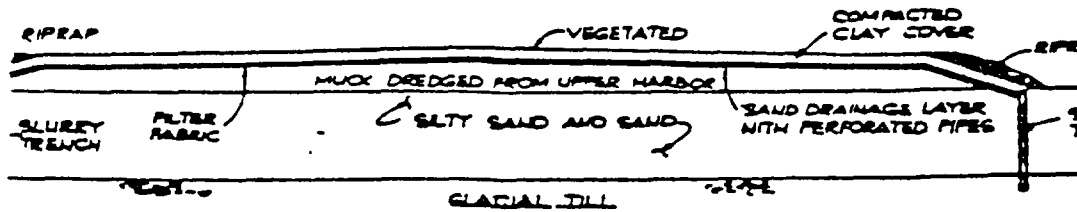
CLAY LINER SYSTEM
TYPICAL CURING CELL SECTION
 1" = 10'



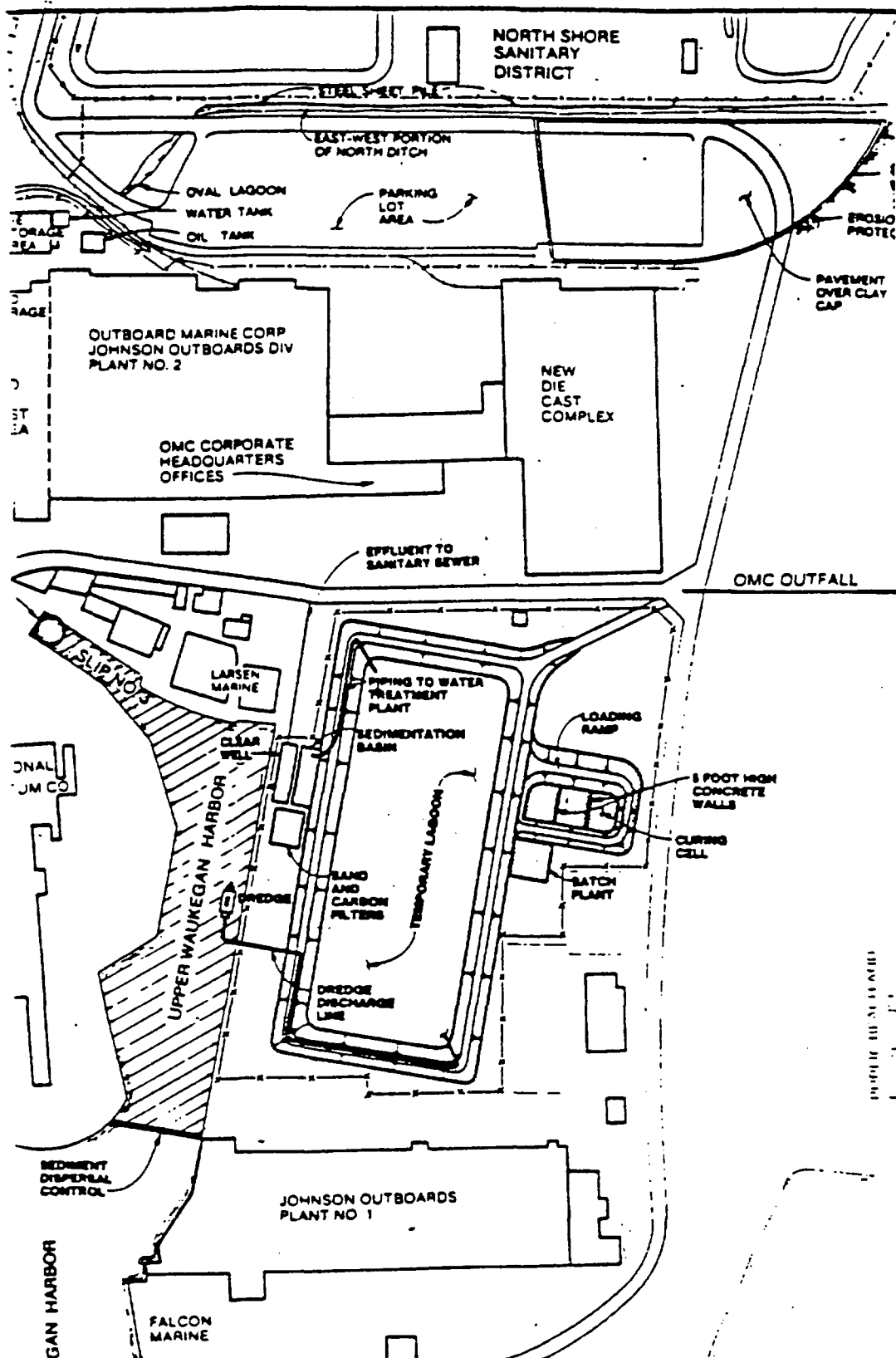
CLAY LINER SYSTEM
TYPICAL CURING CELL
LOADING RAMP SECTION
 1" = 10'



TYPICAL CLAY LINER SECTION



TYPICAL SECTION THROUGH PARKING LOT AREA
 30'



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: MAY 1 1984

SUBJECT: PCB Landfill, Waukegan, Illinois

FROM: Valdas V. Adamkus
Regional Administrator

TO: Richard E. Bartelt, Chief
Remedial Response Branch

Pursuant to the Federal Polychlorinated Biphenyl (PCB) Regulations published on May 31, 1979, 40 CFR 761.75(c), under the authority of the Toxic Substances Control Act of 1976 (Public Law 94-469), I have determined that your application for a PCB landfill located at Waukegan, Illinois does not satisfy the required technical criteria for a chemical waste landfill given at 40 CFR 761.75(b).

This decision is based upon the failure of the proposed landfill to meet the following technical requirements:

1. The hydrologic and geologic conditions at the proposed location will require the use of a synthetic membrane liner, 761.75(b)(2).
2. The bottom of the landfill must be 50 feet from the historic high water table, 761.75(b)(3).
3. The landfill must have an internal leachate collection system, 761.75(b)(7).
4. The landfill must be surrounded by a 6 foot woven mesh fence, 761.75(b)(9).

In addition, the initial report submitted pursuant to 40 CFR 761.75(c)(1) failed to provide several pieces of critical information which would be required regarding the proposed landfill. These include:

1. The soils data given in 761.75(b)(1).
2. Hydrologic information regarding groundwater recharge areas and hydraulic connections between the proposed site and surface water.
3. The 100-year floodplain elevation for the oval lagoon site and information regarding the diversion structure.

4. Baseline groundwater monitoring data for the parameters given in 761.75(b)(6)(iii).
5. Details of construction for the groundwater monitoring wells.
6. A groundwater sampling and analysis plan including test procedures, quality assurance, and records retention.
7. A management plan for the treatment and disposal of leachate, including sampling and analysis procedures.
8. An operations plan which describes procedures to be used for:
 - . record keeping
 - . excavation and backfilling
 - . segregation of incompatible wastes
 - . burial coordinates
 - . vehicle and equipment movement
 - . haul roads
 - . emergency contingency plans
 - . security measures.
9. A record keeping plan which meets the requirements of 761.75(b)(8)(iv) and 761.180.
10. Information regarding State and local approvals or permits for the construction of the landfill and the discharge of leachate.

Valdas V. Adamkus (Acting)

Valdas V. Adamkus



United States Department of the Interior

FISH AND WILDLIFE SERVICE

ROCK ISLAND FIELD OFFICE (ES)

1830 Second Avenue, Second Floor

Rock Island, Illinois 61201

IN REPLY REFER TO:

Commercial: 309-793-5800

FTS: 386-5800

December 14, 1983

Mr. Jack E. Braun
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Braun:

This responds to your November 23 letter in which you request our review and comment on a document entitled "Source Control Feasibility Study - OMC Hazardous Waste Site, Waukegan, Illinois".

We have reviewed the document and have no comments on it. We would like to suggest, however, that if no monitoring program of PCB levels in aquatic and water-dependent biota exists, one should be established. It is important to know whether the Waukegan Harbor clean-up will result in lower concentrations of this substance being recorded in local fish, macroinvertebrates, waterfowl and fish eating birds. This is necessary both from a fish and wildlife standpoint and human health and welfare.

This letter provides comment under the authority of an in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act of 1969 and the Endangered Species Act of 1963, as amended.

Sincerely,

Thomas M. Groutage
Field Supervisor



DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
219 SOUTH DEARBORN STREET
CHICAGO, ILLINOIS 60604

15 August 1983

REPLY TO
ATTENTION OF:

Regulatory Functions Branch

RECEIVED

AUG 16 1983

EPA HQ
OFFICE OF REGIONAL
ADMINISTRATION

Mr. Valdas V. Adamkus
Regional Administrator, Region V
U. S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Adamkus:

This is in response to your 21 April 1983 letter and Mr. Jack E. Braun's 15 April 1983 letter regarding the use of the Source Control Feasibility Study, OMC Hazardous Waste Site, Waukegan, Illinois as the "Functional Equivalent" of an Environmental Impact Statement. My legal staff has reviewed the example court cases relating to the concept of functional equivalency and I concur that the Feasibility Study for the Waukegan Harbor cleanup will meet the criteria required by the Corps' permit regulations for compliance with the National Environmental Policy Act.

By this letter I am also providing comments on the Feasibility Study for your consideration in preparing your final report. Comments are attached. My staff feels that this information would assist in our permit review of the project, specifically for determining compliance with the Section 404(b) (1) Guidelines, and would serve to strengthen the overall quality of the discussions of environmental impacts in the report.

I continue to support your efforts toward this endeavor and am looking forward to receiving the permit application for the selected source control remedial action alternative. If I can be of any further assistance please contact me. Any questions regarding the permit application can be directed to Mr. Tom Slowinski of the Regulatory Functions Branch, telephone number (312) 353-3170.

Sincerely,

CHRISTOS A. DOVAS, P.E.
LTC, Corps of Engineers
District Engineer

RECEIVED

Enclosure

AUG 17 1983

U.S. EPA, REGION V
WASTE MANAGEMENT DIVISION
OFFICE OF THE DIRECTOR

O:WMP
ESD
CC: GLNPO
RF, PA
Cameron
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RL.

Comments on
USEPA FEASIBILITY STUDY, WAUKEGAN HARBOR
Chicago District, Corps of Engineers

12 August 1983

1. The discussions of phytoplankton, zooplankton, benthic macroinvertebrates and fish appear to relate to the general Lake Michigan area. Site special information for the upper harbor area and Slip 3 should be included with a discussion of the associated temporary and permanent impacts that would result from the alternatives.
2. The listing of fish species, with the exception of the bloater and alewife, only lists recreational and commercial fish species. The secondary fishery which exists in the harbor and adjacent areas and a discussion of the existence of spawning and/or nursery areas in the project area should be included with a discussion of the associated temporary and permanent impacts that would result from the alternatives. The discussion of impacts indicate that commercial fishing exists in the area but does not indicate the significance of this in relation to commercial fishing in adjacent portions of Lake Michigan or other harbor areas. The text does state that "commercial fishing is restricted" but does not state the reason for this restriction. The lack of clarity leaves one to question if the restriction is due to the PCB concentrations in fish or due to the Illinois Department of Conservation's (IDOC) prohibition of commercial fishing within 1000 yards of any shoreline, pier or post. If the restriction is due to the IDOC prohibition, the restriction would remain regardless of whether or not the PCB contaminants are removed. This needs to be clarified.
3. The report states that the bald eagle and 15 state endangered birds and 5 state endangered plants are known or likely to be present in the project area. However, the state endangered species are not identified nor is there any discussion as to habitat requirements and project impacts on the bald eagle, the state endangered species, or the habitat they utilize in the project area.
4. The report discusses noise impacts but there are no other discussions of temporary or permanent aesthetic impacts such as degradation of the visual and odor qualities of the project area. The report discusses worker safety with regard to PCB volatilization during the project operations but provides no indication of the impact of volatilization on wildlife, plants, or the general public.
5. In the description of alternative impacts, the report states that the water level in the dredging areas and/or cofferdams would be lowered by continuous pumping to create net inflow to the area. The report needs to clarify where the water would be pumped, what type of monitoring would be conducted during dredging, and what treatment the water would receive, if required.

MEMORANDUM FOR RECORD

9 February 1984

SUBJECT: Chemical Test on Geotechnical Samples at OMC

1. As part of the site selection study for proposed disposal of maintenance dredgings from Waukegan Harbor federal channel, geotechnical sampling was undertaken at three sites. One of the three sites was site 16 on Outboard Marine Corporation property near Waukegan Harbor. The purpose of the geotechnical sampling was to determine engineering characteristics of the foundation such as permeability and gradation of the soil samples, and shear strength.
2. A chemical analysis was undertaken of two samples at site 16 to determine if special handling procedures would be required during physical and geotechnical analysis of the soil samples.
3. A meeting was held 30 September 83 between representatives of the Chicago District Corps of Engineers, Outboard Marine Corporation and the U.S. Environmental Protection Agency to determine the scope of chemical analysis. Those present were:

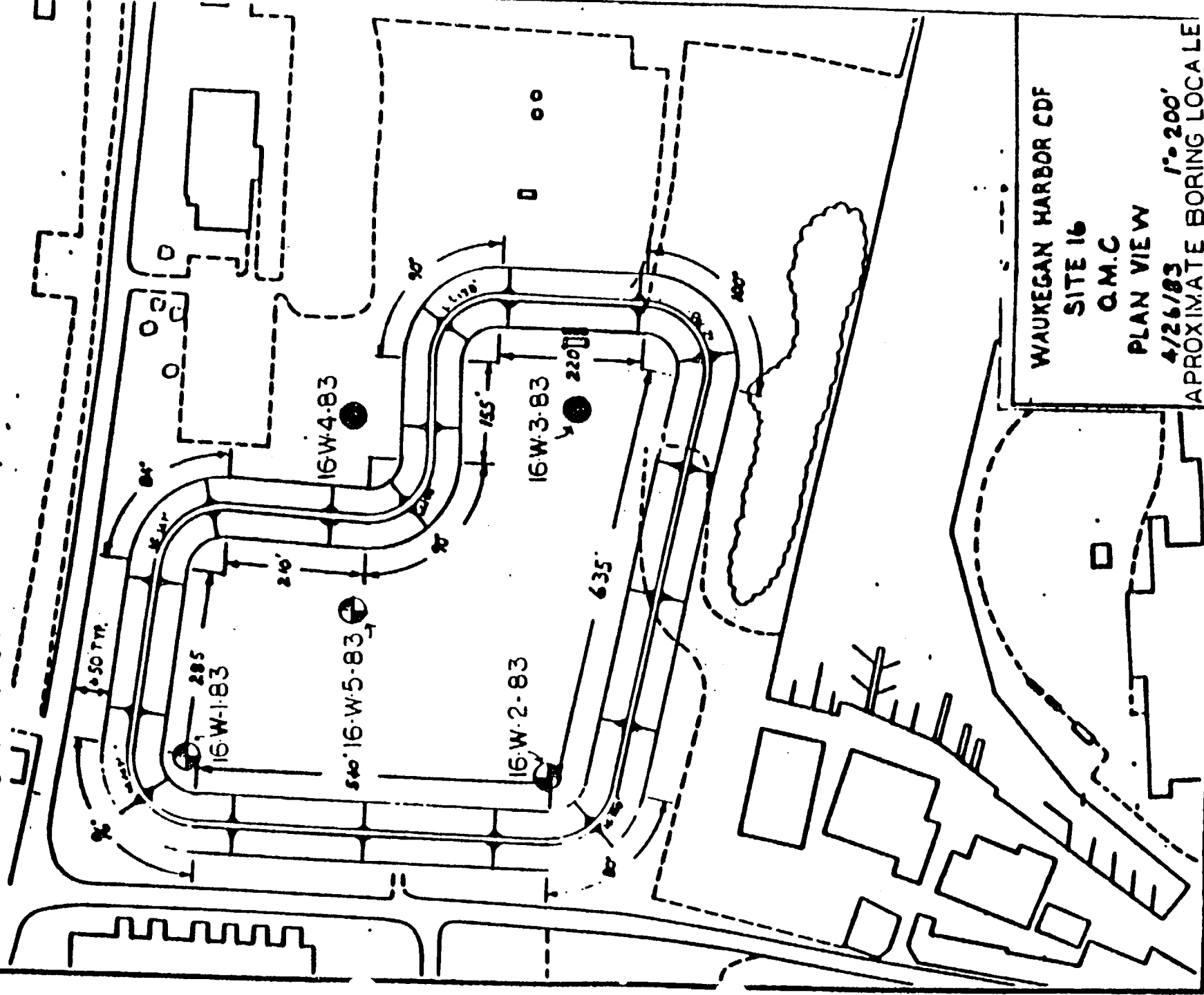
Roger Crawford	Outboard Marine Corporation
Jeff Fort	Attorney, Outboard Marine Corporation
Jack E. Braun	USEPA - RRS II
Sebastian T. Path	USEPA
Rod Lynn	Project Manager, Corps of Engineers
Jan Miller	Environmental Engineer, Corps of Engineers
George Sanborn	Chief, Geotechnical Section, Structural Corps of Engineers
Jim Knox	District Geologist, Corps of Engineers
4. The location of soil borings are as shown on the attached plate (Incl 1). Also attached is a profile of the boring logs of the OMC site (Incl 2). Sample no. 13A from Boring 16W-3-83 and sample no. 6 from Boring 16W-4-83 were used for chemical analysis. Half of each sample was retained by OMC as a reference sample.
5. The chemical analysis of the two samples showed that special handling procedures would not be necessary. The data obtained by Ohio River Division Laboratory and their contracted firm is attached (Incl 3).

3 Incls
as


Mike Neeley
Engineer in Training


Jan Miller
Environmental Engineer

VOLUME 76,000 Cu. Yds.
 PERIMETER 2935 ft. (DIKE &)
 AREA REQ'D 14.9 Acres
 DIKE HEIGHT 13.5 ft



WAUKEGAN HARBOR CDF
 SITE 16
 Q.M.C
 PLAN VIEW
 4/26/83 1"=200'
 APPROXIMATE BORING LOCALE

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GRAY WHITE CONCRETE

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[illegible]

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DEPARTMENT OF THE ARMY
U.S. Army Engineer Division, Ohio River
P.O. Box 27168, 5851 Mariemont Avenue
Cincinnati, Ohio 45227

ORDED-GL

25 January 1984

US Army Engineer District, Chicago
Hydrology & Hydraulics Branch
219 S. Dearborn Street
Chicago, Illinois 60604
Attention: Ms. Jan Miller

Dear Jan,

Inclosed please find results of the core samples from Waukegan Harbor area. Results indicate that no significant concentration of toxic or hazardous organics are present. The inorganics indicate that these cores are within ranges we have dealt with before.

Sincerely,

Ty Gouda

Ty Gouda
Chief Chemist

INCL 3

DATA SUMMARY

A. Inorganic (ppm)

	<u>Sample 6</u>	<u>Sample 13A</u>
Arsenic	13	12
Barium	3	6.2
Cadmium	L 1	L 1
Chromium	4.1	8.5
Lead	2.4	L 1
Mercury	L 1	L 1
Selenium	1.1	1.7
Silver	L 1	L 1
PH	6.0	8.0
Oil & Grease	1.6	4.1

B. Organic (ppb)

	<u>Sample 6</u>	<u>Sample 13A</u>
PCB's:		
Aroclor 1221	L10	L10
Aroclor 1016	"	"
Aroclor 1232	"	"
Aroclor 1242	"	"
Aroclor 1248	"	"
Aroclor 1254	"	"
Aroclor 1260	"	"
Aroclor 1262	"	"
Pesticides:		
A-BHC	L1	L1
B-BHC	"	"
G-BHC	"	"
D-BHC	"	"
heptachlor	"	"
aldrin	"	"
heptachlor epoxide	"	"
p, p' DDE	"	"
p, p' DDD	"	"
p, p' DDT	"	"
dieldrin	"	"

DATA SUMMARY

Pesticides (cont'd)

	<u>Sample 6</u>	<u>Sample 13A</u>
A-endosulfan	L1	L1
B-endosulfan	"	"
endrin	"	"
endrin aldehyde	"	"
endosulfan sulfate	"	"
methoxychlor	L10	L10
texaphene	L10	L10
chlordane	L10	L10

C. GC/MS Scan - See attached sample report from PEDCO

FEDCO ENVIRONMENTAL, INC
PRIORITY POLLUTANT ANALYTICAL DATA

SAMPLE IDENTIFICATION: #6
FEDCO NUMBER: DB606

ACID COMPOUNDS	UG/KG	BASE/NEUTRAL COMPOUNDS	UG/KG
2,4,6-TRICHLOROPHENOL	ND	4-BROMOPHENYLPHENYLETHER	ND
P-CHLORO-M-CRESOL	ND	BIS(2-CHLOROISOPROPYL) ETHER	ND
2-CHLOROPHENOL	ND	BIS(2-CHLOROETHOXY) METHANE	ND
2,4-DICHLOROPHENOL	ND	HEXACHLOROBTADIENE	ND
2,4-DIMETHYLPHENOL	ND	ISOPHORONE	ND
2-NITROPHENOL	ND	NAFTHALENE	2170
4-NITROPHENOL	ND	NITROBENZENE	ND
2,4-DINITROPHENOL	ND	N-NITROSODIMETHYLAMINE	ND
4,6-DINITRO-O-CREOSOL	ND	N-NITROSODIPHENYLAMINE	ND
2,4,6-TRICHLOROPHENOL	ND	N-NITROSODI-N-PROPYLAMINE	ND
2,4,6-TRICHLOROPHENOL	ND	BIS-2-ETHYLHEXYLPHTHALATE	440.
		BUTYLPHENYLPHTHALATE	ND
		DI-N-BUTYLPHTHALATE	73.5
		DI-N-OCTYLPHTHALATE	ND
		DIETHYLPHTHALATE	ND
		DIMETHYLPHTHALATE	ND
		BENZO(A)ANTHRACENE AND/OR	ND
		CHRYSENE	ND
		BENZO(A)PYRENE	ND
		3,4-BENZOFLUORANTHENE AND/OR	ND
		BENZO(K)FLUORANTHENE	ND
		ACENAPHTHYLENE	309
		ANTHRACENE	35.8
		PHENANTHRENE	85.4
		BENZO(G,H,I)PERYLENE	ND
		FLUORENE	155.
		DIBENZO(A,H)ANTHRACENE	ND
		INDENO(1,2,3-CD)PYRENE	ND
		PYRENE	31.2
ACENAPHTHENE	ND		
BENZIDINE	ND		
1,2,4-TRICHLOROBENZENE	ND		
HEXACHLOROBENZENE	ND		
HEXACHLOROETHANE	ND		
BIS(2-CHLOROETHYL) ETHER	ND		
2-CHLORONAPHTHALENE	ND		
1,2-DICHLOROBENZENE	ND		
1,3-DICHLOROBENZENE	ND		
1,4-DICHLOROBENZENE	ND		
3,3'-DICHLOROBENZIDINE	ND		
2,4-DINITROTOLUENE	ND		
2,6-DINITROTOLUENE	ND		
2,2-DIPHENYLHYDRAZINE	ND		
FLUORANTHENE	34.1		
4-CHLOROPHENYLPHENYLETHER	ND		

ND=NOT DETECTED (<25.UG/KG)

FEDERATION ENVIRONNEMENTALE INC.

五十一

八五九

[illegible]

ND=NOT DETECTED (COS.UG/NG)



May 6, 1983

W65128.00

Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency - Region V
Remedial Response Section 2 5HR - 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: OMC - EPA 01-5V28.0

We are pleased to respond to EPA WA 01-5V28.0 to conduct a RAMP for the OMC hazardous waste site. We understand the RAMP should focus on the development of a critical path schedule for the project. Documentation of the OMC site is not required.

The development of the CPM Schedule will include identification of the various elements and activities necessary to complete the remedial actions at the OMC hazardous waste site. The generic flow sheet developed by NUS will be utilized as a guideline in development of the RAMP for OMC.

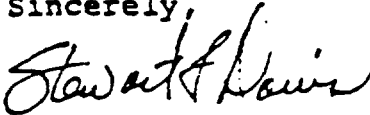
We anticipate the work effort will not exceed the authorized \$25,000. The draft CPM schedule report will be issued June 24, 1983. Review of the draft report by EPA should be complete by July 11, 1983, to allow the report to be finalized simultaneously with the draft conceptual design report (WA 05-5M28.0 for the OMC site).

PD102.017.1

Mr. Jack Braun
Page 2
May 6, 1983
W65128.00

Please call if you have any questions or comments regarding this RAMP.

Sincerely,



Stewart L. Davis
Site Project Manager

Enclosures

cc: R. Bartelt/REM-RPO (EPA V)
N. Willis/REM-DPO (EPA HQ)
D. Huber/(EPA HQ)
R. D'Agostaro/AZPM-REM (WDC)
D. Shoup/Project Assistant (WDC)
W. Sellman/AZPM-ADMIN (WDC) (2 copies)
W. Wallace/QAM (SEA)
F. Marotte/RPTL (DEN)
M. Harris/RPTL (GLO)
S. Hoffman/RPTL (SEA)



May 24, 1983

W65928.00

Mr. STUART DAVIS

Mr. Jack Braun
U.S. Environmental Protection Agency
Region 5
230 S. Dearborn Street
Chicago, Illinois 60604

Subject: Draft Work Plan
Support for Community Relations
Outboard Marine Corporation, Illinois
23.5V28.0

Dear Jack:

Enclosed are three copies of the draft work plan for the subject project. This work plan reflects the activities and schedule that we discussed previously. Based on my recent discussions with John Oaks, it appears that changes in both the scope and schedule will be required within the next few weeks. In anticipation of the expected change in schedule, I have not provided a project flow chart. It will be prepared once the scope of activities and final schedule have been agreed upon.

The draft work plan provides a sequential listing of the community relations activities to be completed on the OMC project. It also outlines personnel allocations for each task. An optional Form 60 provides the necessary budget information.

I look forward to your review of the attached draft work plan. Please call me if you have any questions.

Sincerely,

Nancy R. Tuor

Enclosures

cc: Marcia Carlson, Region 5
Dorothy Tyler, HQ
Nancy Willis, HQ
Mike Harris, CH2M HILL/GLO
Bob D'Agostaro, CH2M HILL/ZPMO
Bill Wallace, CH2M HILL/SEA
Rich Bartelt, Region 5



engineers
planners
economists
scientists

June 22, 1983

W65928.00

Mr. Jack Braun
U.S. Environmental Protection Agency
Region 5
230 S. Dearborn Street
Chicago, Illinois 60604

Subject: Revised Work Plan Community Relations Support
Outboard Marine Corporation site

Dear Jack:

Enclosed are three copies of the revised work plan for Community Relations Support for the OMC site. The work plan has been prepared as an addendum to the existing community relations plan.

This revised work plan responds to the comments you provided on the draft work plan. I have included the cost-to-date information that you requested.

If you have any questions or require further revisions, please call me at (503) 224-9190.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Nancy R. Tuor'.

Nancy R. Tuor
Project Manager

Enclosures

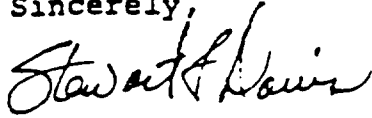
cc: Marcia Carlsen, Region 5
Dorothy Tyler, HQ
Nancy Willis, HQ
Mike Harris, CH2M HILL/GLO
Bob D. Agostaro, CH2M HILL/ZPMO
Bill Wallace, CH2M HILL/SEA
Rich Bartlet, Region 5

972.116.1

Mr. Jack Braun
Page 2
May 6, 1983
W65128.00

Please call if you have any questions or comments regarding this RAMP.

Sincerely,



Stewart L. Davis
Site Project Manager

Enclosures

cc: R. Bartelt/REM-RPO (EPA V)
N. Willis/REM-DPO (EPA HQ)
D. Huber/(EPA HQ)
R. D'Agostaro/AZPM-REM (WDC)
D. Shoup/Project Assistant (WDC)
W. Sellman/AZPM-ADMIN (WDC) (2 copies)
W. Wallace/QAM (SEA)
F. Marotte/RPTL (DEN)
M. Harris/RPTL (GLO)
S. Hoffman/RPTL (SEA)

**CH2M
HILL**
engineers
planners
economists
scientists

RECEIVED

1983

October 31, 1983

W65328.00

Mr. Bruce E. Poetter, Manager
Coldwell Banker Real Estate Appraisal Services
1900 Spring Road
Oak Brook, Illinois 60521

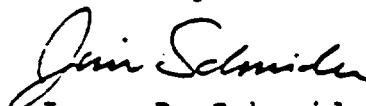
Dear Mr. Poetter:

Subject: Outboard Marine Corporation
Waukegan, Illinois

As we discussed last week, enclosed is a sketch (Sketch No. 1) indicating the assumed size of the replacement harbor area. We believe that a strip of land 25 feet back from the face of the new harbor area should be provided for future maintenance access, and possible tiebacks for the piling. The total area required would be as shown on Sketch No. 2.

Please feel free to call if you have any questions.

Sincerely,


James R. Schneider
Geotechnical Engineer

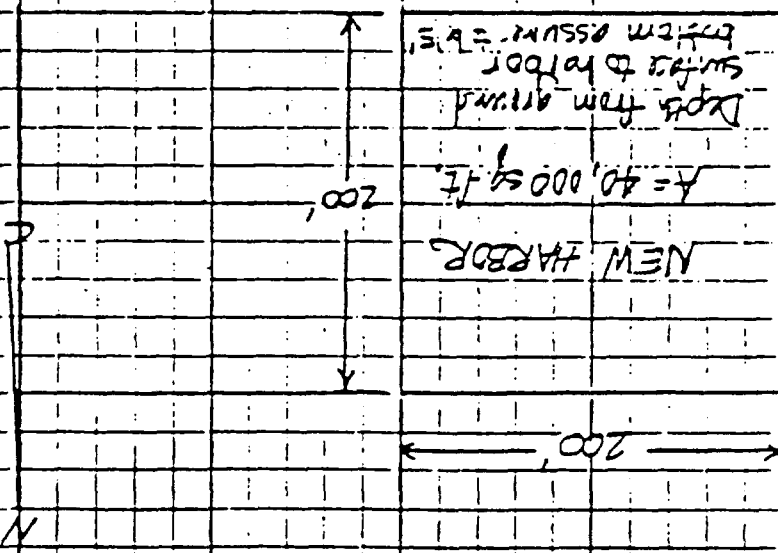
cc: Pamela Rekar, USEPA V
Jack Braun, RSPO, USEPA V
Stu Davis, SPM, CH2M PDX

PDC115.034.1

Portland Office

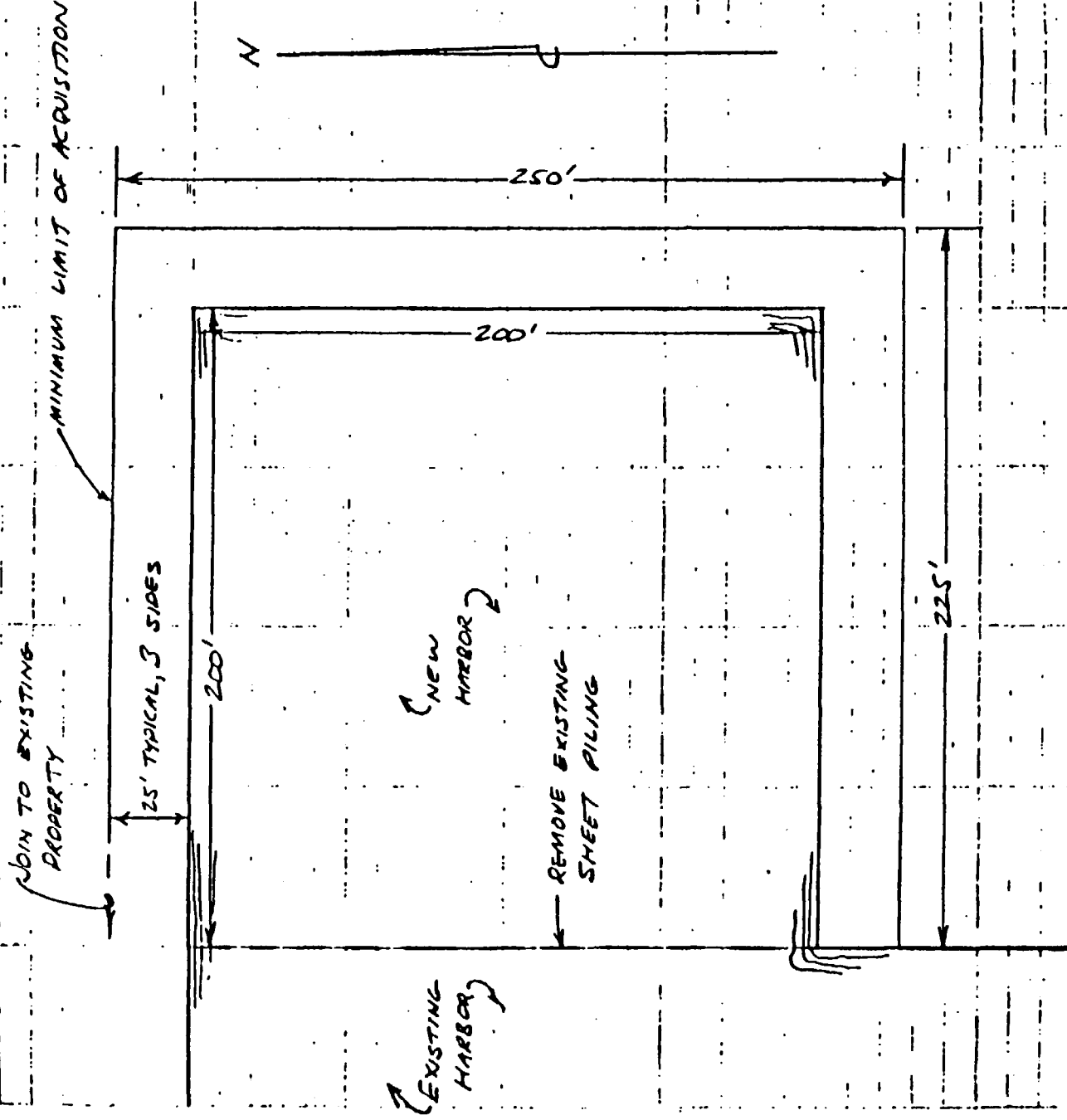
NO SCALE

SKETCH NO. 1



ALTERNATIVE 6B - Assumed size of new harbor area





SKETCH NO 2

NO SCALE

NOV 25 1984

November 21, 1983

W65328.00

Mr. Jack Braun, RSPO
EPA--Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: OMC--EPA 13-5M28.0

This letter is to confirm the cost information for including wells and treatment of water pumped from within the slurry walls at Slip No. 3 and the North Ditch/Crescent lagoon. The purpose of pumping is to maintain positive flow into the containment area.

Estimated flowrate into the containment area is based on a permeability of 10^{-6} cm/sec for the glacial till and 10^{-7} cm/sec for the slurry wall. With a differential head of 2 feet (i.e., water level 2 feet lower inside containment cell) and using the above coefficients of permeability, the flow into the cell is expected to be less than 1 gpm for Slip No. 3, for example. Sand lenses could increase this flow substantially. The presence of sand lenses can be evaluated during the construction.

Even if the flow is an order of magnitude greater than anticipated, only 10 gpm is expected from the Slip. About 10 gpm is also expected from the Crescent lagoon, bringing the total flow to 20 gpm. The treatment unit proposed for use during construction exceeds anticipated requirements during the maintenance period; therefore, a smaller unit should be provided for use during the operation period.

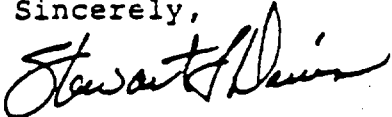
The system would consist of monitoring wells, collection piping, and controls at each containment area. Pumps would discharge to the granular activated carbon (GAC) adsorption system. A GAC system sized for 50 gpm and 20 minutes detention time is proposed. The dual-tank system would

Mr. Jack Braun
Page 2
November 21, 1983
W65328.00

receive flow from the two containment areas. Costs associated with the construction and operation of the system are summarized in the attached table.

Please call if you have any questions regarding the information provided above.

Sincerely,



Stewart L. Davis
Site Project Manager

Enclosures

cc: R. Bartelt/REM-RPO (EPA V)

For S+u DAVIS

COST SUMMARY

Item	Capital Cost	Present ⁽¹⁾ Worth of	
		Other Costs	Present Worth
<u>Site No. 2--Monitoring wells, collection system, pump, con- trols, and electrical service</u>	\$ 22,000	\$ 14,200	\$ 36,200
<u>Crescent Station--Monitoring wells, collection system, pump, controls, and electrical service</u>	22,000	14,200	36,200
<u>Treatment System--Skid-mounted, dual pressure, granular activated carbon adsorption system with controls, miscellaneous piping, and shelter</u>	<u>90,000</u>	<u>90,000</u>	<u>129,000</u>
Subtotal	83,000	118,400	201,400
Contingency	<u>27,000</u>	<u>36,600</u>	<u>63,600</u>
Total	\$110,000	\$155,000	\$265,000

(1) Present Worth values using 10 percent discount rate, 30 year life.

RECORD OF
COMMUNICATION

☒ Phone Call ☐ Discussion ☐ Field Trip ☐ Conference
☐ Other (Specify)

TO: PAMELA REKAR ORC
STU DAVIS CH₂M-HILL

FROM:
JACK BRAUN

DATE 12-1-83
TIME 1040 CST

SUBJECT Potential installation of internal drainage system in containment cells at time of cell construction (VERSUS some time in the future if cells start to leak).

SUMMARY OF COMMUNICATION

USEPA requested CH₂M-Hill to develop cost information concerning installing the drainage system as the cells are constructed, as opposed to installing the drains after the cells are cased.

CH₂M-Hill developed the information and submitted it in writing on November 21, 1983.

We reviewed the submittal and determined that implementation of the entire system would not be appropriate at this time.

Benefits would be derived from installing all below ground collector pipes and wells. The wells would then be cased at the surface. The cost of the collector pipes and wells is about \$2000⁰⁰ per well. There would be four wells at

each site. This would increase the capital cost at Slip 3 and the north ditch area \$8000⁰⁰ per location. Collector piping, pumps, and the treatment system can be installed should a leak occur, at a later date with no additional difficulties.

It was therefore suggested to include the pumpout system wells as part of the initial cell construction. The wells will be installed and cased at the surface. Pumps, collector pipes and a treatment system can be installed, if needed, to mitigate a leak at the time it is needed.

cc Stu Davis CH₂M-Hill

Pam Rekar ORC



engineers
planners
economists
scientists

March 13, 1984

W65328.00

Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency - Region V
Remedial Response Section 2 5HR - 13th Floor
320 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: OMC - Potential Land Uses
EPA 05-5M28.0

As you requested, we have reviewed the proposed closure alternative for the OMC site to summarize the potential uses of the property after capping. The Feasibility Study report dated July 1983 proposes that an artificial membrane be placed to cover the contaminated soil, and that the membrane be covered by a soil cap. The cap would be overlain by asphalt at the surface.

In summary, we recommend that no construction be permitted that would in any way endanger the integrity of the artificial membrane to be installed over the containment area. This would preclude all construction requiring any kind of excavation on the site. Otherwise, the membrane may be damaged during either installation or maintenance of any buried facilities. Thus, the only permitted uses of the site are parking, outdoor storage of vehicles or material, or similar uses. We recommend that no penetrations of either the membrane or the surrounding slurry trench be permitted. In addition, penetration of piling into the enclosed soil or into the underlying glacial till should not be allowed, thereby minimizing paths for downward migration of PCBs.

It may be possible to construct foundations at the cofferdam if special provisions are made during design. The extent of such provisions would depend on the proposed construction.

If you have any questions about this information, please call me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Stewart L. Davis".

Stewart L. Davis
Project Manager

PDC118.038.1



engineers
planners
economists
scientists

April 4, 1984

W65928.B0

Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency--Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: Response to Items 1, 2, 3, and 5 of March 19, 1984
Letter
OMC site, Waukegan, Illinois
EPA 05-5M28.0

As requested, we have developed two alternatives for containing sediments in the Parking Lot Area and one subalternative to support Larsen Marine's boat launcher. We have also evaluated different cofferdam configurations so that Larsen Marine would not totally lose harbor access. Our response is presented in the following attachments:

- Attachment I, Alternative 6C
- Attachment II, Alternative 6D
- Attachment III, Boat Launcher Foundation
- Attachment IV, Alternative Cofferdam Configuration

We are preparing our response to Item 4 of your letter and expect to transmit it early next week.

If you have any questions about this information, please call me.

Sincerely,

A handwritten signature in cursive script, reading 'Stewart L. Davis'.

Stewart L. Davis
Project Manager

Attachments

PDC296.050.1

ATTACHMENT I

In response to Item 3, Alternative 6C was developed. This alternative started with Alternative 6BI and continued dredging in the harbor down to the 50-ppm level, with the extra dredge spoils going to the Parking Lot Area. It was assumed that Alternative 4 presented in the FS for the Parking Lot Area would be implemented.

Alternative 6C: Contain in Slip No. 3-Dredge part of Upper Harbor-Cap-Contain in Parking Lot Area-Dredge Remainder of Upper Harbor-Cap

A sediment dispersal control device, consisting of a double silt curtain or sheet piling, would be installed at the south end of the Upper Harbor (see Figures I-1 and I-2). Then a cofferdam would be constructed near the east end of Slip No. 3 to close it off. A slurry wall extending into the glacial till would be constructed inside the cofferdam and around the entire perimeter of the containment area.

Dredged sediments with greater than 50-ppm PCBs from the eastern portion of Slip No. 3 and the northern part of the Upper Harbor would be placed within the contained area. Supernatant would be continuously decanted and routed to a 1,500-gpm water treatment plant for suspended solids and PCB removal (to one ppb PCBs), then discharged to the harbor or sanitary sewer. After completion of dredging into the Slip No. 3 containment area, a layer of filter fabric, a 1-foot-thick layer of sand with a drainage system, and a 3-foot-thick compacted clay cap would cover the dredged muck. Five feet of fill over the clay would serve as a surcharge. Water collected from the drainage system would be treated in a 200-gpm water treatment plant. Slip No. 3 would be left permanently filled. Groundwater monitoring wells would be installed around the site for detection of potential PCB migration.

The remainder of the Upper Harbor sediments with greater than 50-ppm PCBs would be dredged and the sediment slurry would be pumped through a pipeline to the initial solids dewatering lagoon.

Solids would be dewatered in a clay-lined dewatering lagoon constructed on OMC property. The supernatant would be continuously decanted and routed to the 1,500-gpm water treatment plant. After the dredging of sediments into the dewatering lagoon is completed, a 200-gpm water treatment plant would treat rainwater and leachate water for the duration of the dewatering process.

A RUC would be used for channeling the sediments to allow surface drainage. The top layer of solids would be dried by evaporation. The dried solids (typically the top one to two feet) would be periodically removed with a dragline. The solids would be loaded into trucks and transported to the containment facility in the OMC parking lot area. This process would be repeated about six times over a 2-year period to remove solids. The dredged sediments, contaminated liner material, and clay cap would make the total height of the parking lot area containment about 10 feet higher than the existing elevation.

After the dewatering process is completed, the water treatment plant would be removed. After settlement of the muck in Slip No. 3 is complete, the excess surcharge material would be removed and the area would be paved.

The cost for Alternative 6C is presented in Table I-1. To compare this Alternative with Alternative 6BI, add the cost of Subalternative I to Alternative 6C. The total cost for Alternative 6CI is \$12,460,000.

Table I-1
 DETAILED COST ESTIMATE
 SLIP NO. 3 AND UPPER HARBOR
 ALTERNATIVE 6C
 CONTAIN IN SLIP NO. 3-DREDGE PART OF UPPER HARBOR-CAP-
 CONTAIN IN PARKING LOT AREA-DREDGE REMAINDER OF UPPER HARBOR-CAP
 OMC HAZARDOUS WASTE SITE
 WAUKEGAN, ILLINOIS
 13-SM28.0

Description	Capital Costs	Present Worth of O&M Costs	Present Worth
Mobilization	\$ 510,000	0	\$ 510,000
Health and safety requirements	280,000	0	280,000
General site preparation	360,000	0	360,000
Sediment dispersal control	60,000	0	60,000
Cofferdam	160,000	0	160,000
Slurry wall	290,000	0	290,000
Dredging Slip No. 3 and part of Upper Harbor sediments	90,000	0	90,000
Dredging remainder of Upper Harbor sediments	170,000	0	170,000
Initial solids dewatering lagoon	1,930,000	\$ 40,000	1,970,000
Solids removal from lagoon	80,000	0	80,000
Transportation and disposal of the remainder of Upper Harbor sediments	130,000	0	130,000
Water treatment plant and water disposal	1,600,000	20,000	1,620,000
Slip No. 3 Clay cap and sur- charge	130,000	0	130,000
Monitoring (wells)	20,000	200,000	220,000
Surcharge removal and paving	50,000	0	50,000
Engineering, legal, and admin- istration	<u>1,000,000</u>	<u>40,000</u>	<u>1,040,000</u>
Subtotal	6,860,000	300,000	7,160,000
Contingency	<u>2,060,000</u>	<u>90,000</u>	<u>2,150,000</u>
Total	\$8,920,000	\$390,000	\$9,310,000

ATTACHMENT II

In response to Item 2, Alternative 6D was developed to dredge Slip No. 3 and Upper Harbor sediments and deposit the spoils in the Parking Lot Area. It was assumed that Alternative 4 presented in the FS for the Parking Lot Area would be implemented.

Alternative 6D: Contain in Parking Lot Area-Dredge Slip No. 3 and Upper Harbor-Cap

A sediment dispersal control device, consisting of a double silt curtain or sheet piling, would be installed at the south end of the Upper Harbor (see Figure II-1). Sediments in excess of 50-ppm PCBs would be removed by hydraulic dredge and the sediment slurry pumped through a pipeline to the initial solids dewatering lagoon.

Solids would be dewatered in a clay-lined dewatering lagoon constructed on OMC property. The supernatant would be continuously decanted and routed to a 1,500-gpm water treatment plant. After dredging activities are completed, a 200-gpm water treatment plant would treat rainwater and leachate water for the duration of the dewatering process.

A RUC would be used for channeling the sediments to allow surface drainage. The top layer of solids would be dried by evaporation. The dried solids (typically the top one to two feet) would be periodically removed by dragline. The solids would be loaded into trucks and transported to the parking lot area. This process would be repeated about six times over a 2-year period to remove the solids. This alternative assumes that Alternative 4: Contain-Cap (Parking Lot Area Only) is implemented. The dredged sediments, contaminated liner material, and clay cap would make the total height of the parking lot area containment about 14 feet higher than the existing elevation.

The cost for Alternative 6D is presented in Table II-1. To compare this Alternative with Alternative 6BI, add the cost of Subalternative I to Alternative 6D. The total cost for Alternative 6DI is \$12,590,000.

Table II-1
 DETAILED COST ESTIMATE
 SLIP NO. 3 AND UPPER HARBOR
 ALTERNATIVE 6D
 CONTAIN IN PARKING LOT AREA-DREDGE SLIP NO. 3 AND UPPER HARBOR-
 DEWATER IN LAGOON-CAP
 OMC HAZARDOUS WASTE SITE
 WAUKEGAN, ILLINOIS
 13-5M28.0

Description	Capital Costs	Present Worth of O&M Costs	Present Worth
Mobilization	\$ 530,000	0	\$ 530,000
Health and safety requirements	290,000	0	290,000
General site preparation	290,000	0	290,000
Sediment dispersal control	80,000	0	80,000
Dredging	280,000	0	280,000
Initial solids dewatering- lagoon	2,690,000	\$ 40,000	2,730,000
Water treatment plant and water disposal	1,590,000	80,000	1,670,000
Solids removal	130,000	0	130,000
Transportation and disposal	210,000	0	210,000
Engineering, legal, and admin- istration	<u>1,030,000</u>	<u>20,000</u>	<u>1,050,000</u>
Subtotal	7,120,000	140,000	7,260,000
Contingency	<u>2,140,000</u>	<u>40,000</u>	<u>2,180,000</u>
Total	\$9,260,000	\$180,000	\$9,440,000

9.44
 3.16
 2.04

ATTACHMENT III

In response to Item 1, Subalternative J was developed to consider foundation support for Larsen Marine's boat launcher.

Subalternative J: Boat Launcher Foundation

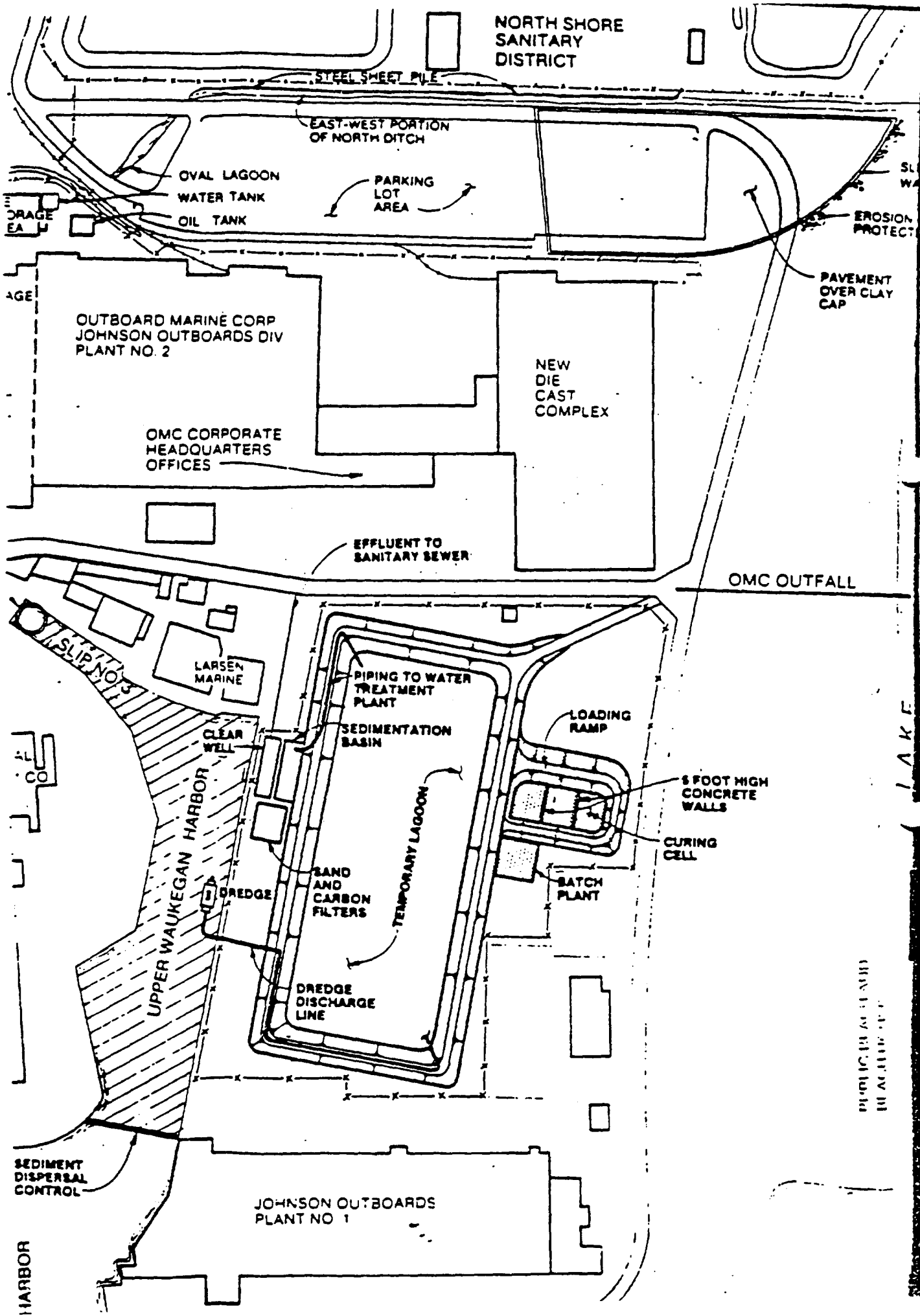
This subalternative would be used only in conjunction with Alternatives 6A, 6B, or 6C. Two finger piers would be constructed to support Larsen Marine's boat launching crane. The two finger piers would be about 4 feet wide by 50 feet long. They would be supported using 30-foot-long vertical and batter piles. The piles would be driven through stabilizing fill on the Upper Harbor side of the cofferdam. The estimated cost for this subalternative would be about \$40,000. Details for this subalternative will be developed during the conceptual design phase.

ATTACHMENT IV

In response to Item 5, we have evaluated different cofferdam configurations to avoid isolating Larsen Marine from harbor access. A cofferdam located along a north-south line extended from the western side of the Upper Harbor was evaluated. This area would enclosed Slip No. 3 and contain about 28,000 yd³ of dredged sediment and 7,200 yd³ of Slip No. 3 sediment. The remaining 7,700 yd³ of Upper Harbor sediments could be contained in Slip No. 2.

If the cofferdam was located at the location for Alternative 6B, about 25,500 yd³ would still require containment. Slip No. 2 has about 16,300 yd³ of available storage. This would require additional storage for about 9,200 yd³ of Upper Harbor sediments. These sediments could be dewatered in an initial solids dewatering lagoon and then contained in the Parking Lot Area. Additional containment areas in the Upper Harbor would restrict boat traffic pathways.

Placing the cofferdam in Slip No. 3 with its axis along the extended north-south line would still reduce Larsen Marine's harbor access and enclosing Slip No. 2 only yields a small storage volume (after construction of the cofferdam). The apparent benefit is small.



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April 6, 1984

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Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency--Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: Partial Response to Item 4, March 19, 1984, Letter
Review of Lake Michigan Federation Comments
OMC Site, Waukegan, Illinois
EPA 05-5M28.0

At your request, we have reviewed the comments from the Lake Michigan Federation and Citizens for a Better Environment (LMF) transmitted with their letter of September 1, 1983. Their comments concern the proposed remedial actions at the OMC site. We have reviewed the LMF comments relative only to the technical issues addressed, and not relative to policy issues.

The LMF comments can be divided into five general categories:

1. Policy issues, such as EPA support of new technology development
2. Technology issues, such as the use of High-Temperature Fluid-Wall Reactors
3. Design issues, such as truck liners, covers, and transportation routes
4. Issues relating to the extent of the response
5. Miscellaneous technical issues

As mentioned previously, this letter does not address EPA policy issues.

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Portland Office

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TECHNOLOGY ISSUES

The LMF comments include a wide range of remarks suggesting that new and emerging technologies should be considered in greater depth. In general, such technologies were eliminated from consideration during the FS because one of the site-specific criteria was to complete the remedial actions within a reasonable time (by the end of 1986; refer to FS, p. 1-12). Technologies mentioned in the LMF comments, such as extraction and distillation processes, the High-Temperature Fluid-Wall Reactor, and the Supercritical Water oxidation process, are unproven on a commercial scale. The only relatively "new" technology that appeared feasible was incineration. However, incineration was eliminated in the preliminary screening because:

- Permitting and construction of an onsite incinerator would probably take 7 or more years, well beyond the target date for project completion.
- No existing mobile incinerators that have been demonstrated to conform to the requirements of 40 CFR 761.70 were identified during preparation of the FS.
- At the time of the FS, there were no licensed commercial PCB incinerators in the United States with sufficient capacity to complete the PCB destruction in a reasonable time.
- Costs for hauling to and disposal in a PCB-approved landfill were less than costs for incineration.

LMF is correct in suggesting that the multiple-hearth incinerator would likely be the method of choice for the OMC site, if incineration were to be chosen. A review of various available PCB destruction systems made during the preliminary screening indicated that incineration offered the only potentially available, feasible means of PCB destruction for the contaminated sediment and soil at Waukegan. Costs were estimated to be on the order of \$500 to \$1,000 per cubic yard of contaminated sediment and soil (FS, p. 4-10). To confirm this estimated cost range, we contacted the SCA Services Chicago Plant to discuss incineration costs. SCA Chicago is licensed to incinerate PCBs in liquid or solid form. The

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PCBs must be delivered in 15- or 30-gallon drums. The cost of incineration typically varies from \$60 to \$80 per drum regardless of the drum size. This equates to a cost of \$425 to \$575 per cubic yard, assuming 30-gallon drums 95 percent full. The drums themselves will cost about \$22 each (ICC-approved for interstate transportation of hazardous waste), equating to about \$150 per cubic yard for drums. Transportation is estimated to cost about \$30 per cubic yard to the SCA site, for a total of roughly \$600 to \$750 per cubic yard.

For comparison purposes only, a rough estimate of the cost of incineration of all PCBs and PCB-contaminated sediment and soil at the OMC site was made based on the FS cost estimates for excavation and disposal alternatives (Slip No. 3 Alternative 2D, Upper Harbor Alternative 2B, North Ditch/Parking Lot Alternative 1). The estimated cost of complete excavation and disposal in a PCB landfill of all sediment and soil with PCB concentrations in excess of 50 ppm was about \$64 million. A cost of \$50 per cubic yard for transportation and disposal was used to develop this estimate. Thus, the total transportation and disposal cost for 260,000 cubic yards of contaminated material (including dewatering lagoon lining and volatilization control material) would be about \$13 million. The cost for incineration of 260,000 cubic yards of material would range from about \$130 to \$260 million (using a range of \$500 to \$1,000 per cubic yard). Adding this to the cost for excavation and related activities gives a total of \$170 to \$300 million for excavation and incineration of sediment and soil with PCB concentrations of 50 ppm or more.

Onsite incineration would reduce transportation costs, but would increase incineration costs by increasing the capital recovery cost per ton incinerated (unless the incinerator became a permanent disposal facility). Offsite incineration would be expected to raise transportation costs while lowering incineration costs. Since this is an order of magnitude greater than the onsite containment alternatives, it was eliminated from further consideration.

To include the 122,000 cubic yards of Lower Harbor sediments containing 10 to 50 ppm PCBs would add an additional \$65 to \$125 million (using the same approximate estimating method), for a grand total in the range of \$235 to \$425 million for excavation and incineration of all sediment and soil with PCB concentrations of 10 ppm or more.

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- The cost per pound of PCBs controlled would have been much higher for the sediments containing 10 to 50 ppm PCBs than for the more contaminated sediment and soil. Therefore, they were eliminated from consideration based on the need for overall funds balancing (CERCLA, Section 104(c)(4); NCP, Section 300.68(k)).

MISCELLANEOUS TECHNICAL ISSUES

A number of miscellaneous technical issues are raised in the LMF comments. Some of the broader issues are discussed below:

1. LMF questions the use of where a clamshell dredge in Slip No. 3. The only place a clamshell dredge would be used is at the deep contaminated sediment area near the former OMC outfall in the slip. This area will be surrounded by a sheet pile cell, with the interior water level lowered to promote net inflow to the cell (FS, p. 6-81). The cell will, in turn, be constructed in the slip behind the cofferdam at the mouth of the slip, and the water level in the slip will be kept below that of the harbor to again promote net inflow to the containment area (FS, p. 6-73).
2. LMF comments that they do not believe that silt curtains will be effective against silt-sized particles. The silt curtains can be constructed of modern, small-equivalent-opening size geotextile, weighted to contact the harbor bottom or keyed into the muck layer. They can be located away from the immediate vicinity of the dredge to reduce the chances of damage from dredging. Fine sediments (.01 mm equivalent diameter--near the middle of the silt-clay range) would be expected to stay in suspension for one or more days in perfectly still water 10 feet deep. The settling time will increase in disturbed water. To help increase the silt curtain effectiveness, the FS (pp. 2-21 and 6-72) recommends a double curtain or sheet piling. During final design, this can be refined, or perhaps a combination can be used, such as a combination sheet pile-silt curtain system or sheet piling with bitumen-treated threads.

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3. LMF suggests that an inflatable dam be considered. These are generally expensive, require special foundation preparation, and pose a vandalism problem requiring continual maintenance.
4. LMF repeatedly points out that the sites do not meet the requirements for a chemical waste landfill under 40 CFR 761.75. We agree, but believe that public health can be protected in a cost-effective manner with the proposed response (40 CFR 300.68(j)). The site would probably have to be permitted under 40 CFR 761.60(a)(5)(iii) or 761.75(c)(4), because it has deficiencies that prevent it from conforming to all of the technical requirements for a new chemical waste landfill (40 CFR 761.75(b)).
5. The LMF comments that the glacial till would be an inadequate containing layer because of observed penetration of PCBs into the till layer at the OMC outfalls in Slip No. 3 and in the Crescent Ditch. This issue is discussed in the FS (p. 6-78). It appears that penetration occurred in these areas because nearly pure PCB fluids were moving in the interstitial pore spaces in the soil. The higher specific gravity of the PCB compounds (1.38 for Aroclor 1242) caused it to flow downward, displacing pore water. Where PCB concentrations are lower, the PCBs are probably adsorbed onto soil particles and/or reduced in mobility by capillary forces in pore spaces. This hypothesis is suggested by the fact that PCB penetration into the till has not been observed elsewhere on the site. Variability in till deposits is also expected, resulting in spatially varying permeabilities.
6. LMF states that containment in the slip and Upper Harbor "leaves little possibility for easy access and removal if a new technology becomes available..." (p. 7). We disagree. The PCBs will be contained in a known location, with known cover conditions. The cap need only be removed to begin excavation. This will be a simple process that can be easily accomplished with ordinary excavation equipment. In fact, later excavation at Slip No. 3 may be easier since prolonged surcharging of

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the soil will have reduced its moisture content to less than what it is today, and the slurry wall will simplify construction dewatering. After excavation, the slip could conceivably be returned to a condition similar to today's.

7. LMF questions the lack of containment measures at the north ditch. No containment was provided in this area because of the high cost per pound controlled, a situation which corresponds to that of the less contaminated sediments in the harbor.
8. LMF suggests that further studies be made of the area behind the north ditch sheet pile wall. This is mentioned as a design issue in the FS (pp. 5-41 and 5-55). The most likely pathway of contamination to this area is migration from the north ditch. Consequently, concentrations in general are probably lower than in the north ditch, so containment may well be even less cost-effective in this area. Control of PCBs in this area should be considered during detailed design.
9. LMF points out that the FS does not discuss the fate of the 6,200 cubic yards of soil excavated from the slurry trench at the parking lot area. The fate of the excavated trench spoil was also not included at Slip No. 3 or the Crescent Ditch and Oval Lagoon, generally because the quantities are small, and because a portion of the soil may be returned to the trench, depending on the type of slurry wall construction chosen. Uncontaminated soil could be disposed of in a conventional landfill or used elsewhere. Contaminated soil could be disposed of onsite in the containment area. For example, the 6,200 cubic yards of soil from the parking lot trench could be spread on the top of the containment area before capping, raising the grade about one-half foot. This is a final design detail.
10. Above-ground temporary storage would not differ greatly from Alternative 6D. The Alternative 6D lagoon could hold the dredged sediments and the north ditch soils at the present design size with about a 3-foot cap. To include the parking lot

Mr. Jack Braun, Site Project Officer
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soil, the dikes would have to be raised by about 5 feet.

Design with details more closely approximating permanent landfill standards would increase the cost significantly and result in a facility similar to that developed previously by Mason and Hanger, but on a larger scale now that the parking lot soils would have to be added.

11. A number of LMF comments pertain to the fish body burdens of PCBs and potential PCB discharges to Lake Michigan that may be expected after completion of the remedial action. Modeling by Hydroqual, Inc., was referred to in the FS (p. 6-22). No subsequent modeling based on the proposed response has been accomplished.
12. LMF points out the possibility of Lake Michigan shoreline changes, as discussed in the FS (p. 5-51). The rate of shoreline movement is a function of lake level, sediment transport, weather, and other factors, and cannot be predicted. One of the maintenance requirements will have to be monitoring of the shoreline erosion (or accretion), and maintenance if the containment area is threatened. This should be considered during final design.

While the LMF comments go into greater detail on many more issues, we believe that these are the main points and that the information in this letter will be useful in responding.

If you have any questions about this information, please feel free to call.

Sincerely,

Deanne L. Kasai

for Stewart L. Davis
Project Manager

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April 10, 1984

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Remedial Response
Section I

Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency--Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: Response to Item 3 of March 22, 1984 Letter
OMC site, Waukegan, Illinois
EPA 05-5M28.0

As requested, we have reviewed the potential for changes in wave action or surging that could develop in Waukegan Harbor if either Alternative 6AI or 6BI were implemented. We have considered these alternatives both with and without the replacement harbor area shown in the Feasibility Study.

A brief review of the location and orientation of the harbor suggests that Lake Michigan waves entering the harbor mouth will be significantly attenuated by refraction at the inner end of the harbor entrance jetties. More critical waves will probably be developed by prevailing winds from the south and south-southwest blowing across the harbor surface for prolonged periods. We would anticipate that waves on the order of 4 feet in height could develop under storm conditions (60 mph wind for 4 hours). A third source of waves is from wakes, which are not expected to be of significant height in Waukegan harbor.

In general, it appears that wave heights in the harbor would either be unaffected or would decrease for any of the four alternatives. This decrease is possible because a portion of the vertical sheet pile walls in the harbor would be replaced by sloping riprap under any of the possible harbor configurations shown in the Feasibility Study.

Waves are usually reflected from a smooth vertical surface (such as sheet piling) with very little loss in energy. As a result, in an enclosed area such as a harbor or a large slip, resonance and focusing may cause wave heights at certain points that are larger than the unreflected waves on the open water of the harbor. Under unfavorable conditions, waves up to twice the height of open-water waves could be generated by reflection. Unfavorable harbor shapes could worsen the conditions. This action is most pronounced when

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Mr. Jack Braun .
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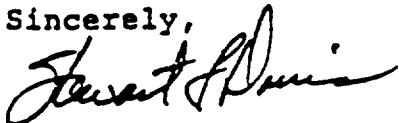
the reflecting surface is vertical, impermeable and relatively smooth. It is reduced when sloping riprap is used at the water's edge since a significant amount of the wave energy is dissipated as the waves strike and run up on the riprap slope. Thus, less energy is returned to the harbor water in the form of waves reflected and refracted from the slope. For a riprap slope with an inclination of 2 horizontal:1 vertical, we estimate that 80 to 90 percent of the impinging wave energy would be absorbed. For a 3H:1V slope, we estimate that 90 to 94 percent of the wave energy would be absorbed on the riprap. Reflected waves would be expected to be less than 25 percent as high as incident waves.

For Alternative 6A1, if the replacement harbor area as shown on Figure 5-3 of the feasibility study is unexcavated, it would be desirable to reorient the cofferdam to avoid creation of a narrow "pointed" portion of the harbor at the extreme north end. A "pointed" configuration could tend to concentrate wave energy at the north end of the harbor if the replacement harbor area is not excavated. Rotating the cofferdam in a more or less clockwise direction would probably be satisfactory. The cofferdam would then run more nearly east-west than northeast to southwest as now shown on Figure 5-3 of the Feasibility Study. This is a detail that could be addressed during final design of the selected alternative.

For the remainder of the alternatives, it appears that changes in the wave characteristics of the harbor would be minimal. It is not possible to determine whether or not there may be isolated areas of resonance or excessive wave amplification without mathematical studies physical modeling of the harbor. This type of analysis should be considered during final design of the selected alternative. If it is found that wave action in the harbor could be significantly and/or detrimentally modified as a result of construction of the selected alternative, it would be possible to either modify the design somewhat or provide wave suppressors to mitigate detrimental effects.

If we can provide you with further information in this matter, please feel free to call.

Sincerely,



Stewart L. Davis
Project Manager



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April 17, 1984

W65928.BO

Mr. Jack Braun, Site Project Officer
U.S. Environmental Protection Agency--Region V
Remedial Response Section 2 5HR, 13th Floor
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Braun:

Subject: Response to Item 1 of March 22, 1984, Letter
OMC Site, Waukegan, Illinois
EPA 05-5M28.0

As requested, we have reviewed the five hearing comments cited by the Corps of Engineers in their letters dated August 12 and 15, 1983. The discussions of environmental conditions and impacts in the Feasibility Study (FS) are based on information presented in the Draft Environmental Impact Statement (DEIS) on the Waukegan PCB Abatement Project, December 11, 1981 (FS Reference Document No. 048).

The DEIS was the supporting document for the environmental section of the FS. Therefore, issues that were included in the DEIS are reflected in the FS; conversely, issues that were not addressed in the DEIS do not appear in the FS because including them would have required a separate research effort beyond the initial scope of work.

The comments presented by the Corps of Engineers generally request information that is not included in the DEIS. The five areas of concern to the corps are more specifically discussed below:

1. No discussion of the site-specific impacts of alternatives on phytoplankton, zooplankton, benthic macroinvertebrates and fish is presented in the Feasibility Study because the DEIS did not directly address these issues.

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Mr. Jack Braun
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2. The only fish species listed in the DEIS that are not included in the Feasibility Study are carp and chinook salmon. The Waukegan area was stocked with chinook salmon until the PCB contamination became evident; however, a spawning run was not established. The DEIS did not address secondary fisheries or the significance of commercial fishing in relation to other areas of Lake Michigan. Commercial fishing is restricted by Wisconsin and Michigan state regulations of the sale of certain species of Lake Michigan fish (primarily salmon and lake trout), which were imposed in 1971.
3. The DEIS did not refer to the 15 birds or the 5 species listed as endangered by the state, nor habitat requirements for any endangered species. A site-specific discussion of the impacts of project alternatives on endangered species was not presented in the DEIS or any of the other documents.
4. The DEIS did not include visual or aesthetic impacts of the alternatives, nor was the impact of volatilization on wildlife, plants, and the general public considered.
5. Water removed from the dredging areas and/or cofferdams to create net inflow would be processed through the treatment plant to reduce PCB concentrations to below 1 ppb (FS, p. 6-76). Monitoring would be done by grab sampling and 24-hour sampling. The treatment plant includes a clearwell to permit monitoring prior to discharge (FS, p. 5-3). The treatment system is described on pages 5-3 and 5-4 of the Feasibility Study. Effluent would be discharged to the sanitary sewer or to Lake Michigan (FS, p. 6-76). Selection of the discharge point must be made during final design.

If you have any questions about this information, please call me.

Sincerely,



Stewart L. Davis
Project Manager

cc: Nancy Willis

RESPONSE TO PUBLIC COMMENTS

OMC HAZARDOUS WASTE SITE WAUKEGAN, ILLINOIS

The United States Environmental Protection Agency (U.S. EPA) has conducted a feasibility study to evaluate cleanup alternatives for the PCB contamination at the Outboard Marine Corporation Site (OMC Site) in Waukegan, Illinois. The feasibility study was completed on July 15, 1983, under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et. seq., and in accordance with the National Contingency Plan (NCP) 40 CFR Part 300. Five cleanup actions were recommended by U.S. EPA as the appropriate cleanup alternative for the OMC site.

The public comment period to review the recommended alternative as well as the Feasibility Study opened on July 15, 1983. An informational meeting to describe the Feasibility Study was held on July 28, 1983. A public meeting was held on August 3, 1983. The public comment period had an extended closing date of September 1, 1983. Twenty-five public comments were received by the U.S. EPA. The U.S. EPA reviewed the comments and other information and determined that two significant issues arose that had a potential to cause a change in the initially recommended project. A public comment period to review the additional issues in conjunction with the Feasibility Study

opened on March 6, 1984. An informational meeting to describe the issues was held on March 14, 1984. The public comment period closed on April 4, 1984. Over 250 public comments were received either during the informational meeting or in writing. In this document, U.S. EPA responds to all the comments received regarding the OMC site.

The OMC Site is located near the intersection of Grand Avenue and Sheridan Road on the west shore of Lake Michigan in Waukegan, Illinois, about 37 miles north of Chicago and 10 miles south of the Wisconsin border.

Waukegan Harbor is an irregularly shaped harbor about 37 acres in area. The two areas of concern are Slip No. 3 and the Upper Harbor. PCB concentrations in Slip No. 3 are greater than 500 parts per million (ppm). In the Upper Harbor, PCB concentrations are between 50 and 500 ppm. Water depths in the harbor generally vary from 14 to 25 feet with some shallower depths in Slip No. 3. The harbor sediments consist of 1 to 7 feet of very soft organic silt (muck) overlying typically 4 feet of medium dense, fine to coarse sand. A very stiff silt (glacial till) that typically ranges from 50 to more than 100 feet thick underlies the sand. The entire harbor is bordered by 20- to 25-ft-long steel sheet piling, except at the Waukegan Port District boat launching areas

and at the retaining wall near the harbor mouth. The sheet piles generally extend into the sand layer above the glacial till.

The North Ditch is a small tributary of Lake Michigan that drains surface runoff from about 0.11 square miles of OMC and North Shore Sanitary District property. The ditch also drains surface runoff from an area west of OMC property and the railroad tracks. The North Ditch includes the 600-ft-long, 20-ft-wide Crescent Ditch; the 240-ft-long, 10- to 20-ft-40-ft-wide Oval Lagoon; and a 2,000-ft-long, 10-to 20-ft-wide east-west portion of the North Ditch. PCB concentrations are between 50 and 5,000 ppm in the North Ditch/Crescent Ditch/Oval Lagoon area. The U.S. Department of the Interior measured the mean daily discharge of the ditch between March and September 1979 as 1.8 cubic feet per second (cfs), with a maximum discharge of 5.3 cfs. They calculated the 5-year storm event to be 23 cfs.

The Parking Lot area is located north of OMC's Plant No. 2 and is about 9 acres in area. PCB concentrations are between 50 to 5,000 ppm. There are three entrances to the Parking Lot area: two fenced entrances in the northwest corner of OMC's property and one fenced entrance southeast of OMC's new die-cast complex at the intersection of OMC's private road and Seahorse Drive.

The generalized subsurface conditions in the North Ditch/
Parking Lot area consist of typically 30 feet of compact,
very fine to fine sand overlying a stiff too very stiff silt
(glacial till). The thickness of the glacial till typically
ranges from 50 to more than 100 feet.

I. STATUTORY AUTHORITY

Section 104 of CERCLA by delegated authority, enables U.S. EPA
to act, consistent with the NCP, to remove or arrange for
removal of, and provide for remedial action relating to a
hazardous substance, pollutant, or contaminant at any time or
take any other response measure consistent with the NCP which
is deemed necessary to protect the public health or welfare or
the environment. 42 U.S.C. 9604. Pursuant to Section 101(24)
of CERCLA, remedial action does not include offsite transport
of hazardous substances, or the storage, treatment, destruction,
or secure disposition offsite of such hazardous substances or
contaminated materials unless a determination has been made
that such offsite action is 1) more cost effective than other
remedial actions, 2) will create new capacity to manage hazardous
substances in addition to those located at the affected facility,
or 3) are necessary to protect public health or welfare or the
environment from a present or potential risk which may be
created by further exposure to the continued presence of such
substances or materials. Consistent with Section 105 of CERCLA,
the NCP establishes the methods and criteria for effectuating

a response measure that protects that public health or welfare or the environment in a cost effective manner. 42 U.S.C.

9605. Subpart F of the NCP, 40 CFR Parts 300.61 - 300.71, set forth the criteria for hazardous substance response. Remedial actions are specifically addressed in 40 CFR Part 300.68.

II. Summary of Alternative Recommended in the Feasibility Study presented during the July, 1983 Public Comment Period

By the July 15, 1983 feasibility study, U.S. EPA recommended five actions for the cleanup of the OMC site for a total estimated cost of \$17, 410,000. Actions 1 and 2 concern Slip No. 3 and the Upper Harbor.

Action 1:

In conjunction with Action 2, below, PCB-contaminated sediment, sand and silt would be dredged from the localized area near the former OMC outfall in Slip No. 3. An estimated 5,700 yd³ of PCB contaminated material, containing about 286,500 lb of PCBs would be removed, fixed and disposed offsite in a licensed chemical landfill. The estimated cost is \$3,150,000.

Action 2:

A containment wall would be constructed around the perimeter of the western portion of Slip No. 3, part of the Upper Harbor sediments would be dredged into the contained area; the containment area would be capped. Approximately 306,900 lb of PCBs in 21,100 yd³ of sediments would be contained. The estimated cost is

\$6,100,000.

Actions 3 and 4 concern the North Ditch Area.

Action 3:

PCB-contaminated soil would be contained and capped in the Crescent Ditch/Oval Lagoon area. The North Ditch would be partly excavated to install a bypass drainage pipe. The PCB-contaminated soil from the bypass excavation would be placed in the Crescent Ditch/Oval Lagoon area before capping the area. Approximately 492,100 lb of PCBs in 51,400 yd³ of soil would be contained. The estimated cost is \$4,210,000.

Action 4:

In conjunction with Action 3, above, PCB-contaminated soil would be excavated from localized area in the Crescent Ditch and Oval Lagoon. An estimated 5,500 yd³ of soil containing about 440,500 lb of PCBs would be removed and disposed offsite in a licensed landfill. The estimated cost is \$740,000.

Action 5 concerns the parking lot area.

Action 5:

Approximately 277,700 lb of PCBs in 105,000 yd³ of soil would be contained and capped in the Parking lot. The estimated cost is \$3,210,000.

III. Summary of Issues Raised by U.S. EPA during the
March, 1984 Public Comment Period

Action 1, 3, 4, and 5, as described in Section II, above, were not altered during the second public comment period of March, 1984. Two additional issues, both involving Slip #3 and the Upper Harbor were addressed.

First, the scope of Action 2, as described in Section II, above, was enlarged to provide for containment of all sediment contaminated to 50 ppm remaining in the Upper Harbor instead of 150 ppm as originally recommended in Action 2, above. With the addition of this material, approximately 310,000 lbs of PCBs in 46,600 yd³ of sediments would be contained. The estimated cost of Action 2 with the increased control to 50ppm is 9,300,000.

Second, U.S. EPA considered on-site containment of PCBs in Slip #3 and the Upper Harbor without constructing a replacement slip as originally envisioned in the Feasibility Study.

IV. Summary of Alternative Chosen by the U.S. EPA
as the Appropriate Remedial Action at the OMC Site

The alternative chosen by the U.S. EPA as the appropriate remedial action at the OMC site differs somewhat from the alternative originally recommended in the Feasibility Study.

The Agency has determined that the cost-effective remedy for the OMC site is the excavation and offsite disposal option as described in the Feasibility Study. (See Feasibility Study, Alternative 2B for Slip No. 3 and the Upper Harbor, Alternative

3 for the North Ditch, and Alternative 1 for the Parking Lot). The cost of this option is approximately \$74,890,000.

Under Section 104(c)(4) of CERCLA and 40 CFR Part 300.68(k) of the NCP, the need for protection of public health, welfare and the environment at a facility must be balanced against the amount of money available in the Hazardous Substance Response Trust Fund (Fund) to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into account the need for immediate action. Because the estimated cost to implement the cost-effective remedy for the OMC site exceeds \$70 million, U.S. EPA conducted an analysis of the Fund assets and determined that implementation of the excavation and offsite alternative would seriously impact U.S. EPA's ability to respond at other hazardous waste sites. Therefore, U.S. EPA evaluated the remaining options to determine if any of them would provide a high degree of protection and reliability while substantially reducing the financial demands on the Fund.

In light of the above, U.S. EPA has determined that the appropriate fund-balanced alternative for the OMC is as follows:

Action 1:

In conjunction with Action 2, below, PCB-contaminated sediment, sand and silt would be dredged from the localized area near the former OMC outfall in Slip No. 3. An estimated 5,700 yd³ of PCB contaminated material, containing about 286,500 lb of PCBs would be removed, fixed and disposed offsite in a licensed chemical landfill. The estimated cost is \$3,150,000.

Action 2:

The PCB-contaminated sediments in excess of 50 ppm would be dredged from the Slip No. 3 and the Upper Harbor. The sediments from Slip No. 3 would be fixed and disposed of in the containment cell being built in the OMC Parking Lot. The sediments from the Upper Harbor would be dewatered in a lagoon on OMC property and then disposed of in the containment cell being built in the OMC Parking Lot. An estimated 310,000 lbs of PCBs in 46,600 yd³ of sediment would be removed and contained in the OMC Parking Lot. The estimated cost is \$9,950,000.

B. North Ditch Area

Action 3:

PCB-contaminated soil would be contained and capped in the Crescent Ditch/Oval Lagoon area. The North Ditch would be partly excavated to install a bypass drainage pipe. The PCB-contaminated soil from the bypass excavation would be placed in the Crescent Ditch/Oval Lagoon area before capping the area. Approximately 492,100 lb of PCBs in 51,400 yd³ of soil would be contained. The estimated cost is \$4,210,000.

Action 4:

In conjunction with Action 3, above, PCB-contaminated soil would be excavated from localized area in the Crescent Ditch and Oval Lagoon. An estimated 5,500 yd³ of soil containing about 440,500 lb of PCBs would be removed and disposed offsite in a licensed

C. Parking Lot Area

Action 5:

Approximately 277,000 lbs of PCBs in 105,000 yd³ of soil would be contained together with the 310,000 lbs of PCBs in 46,600 yd³ of sediment from the Slip No. 3 and Upper Harbor. This parking lot will then be capped. The estimated cost is \$3,210,000.

D. Total Cost

The total cost of the final-balanced alternative is \$20,150.

V. Comments

During the first public comment period, twenty-five comments were received by U.S. EPA regarding the Feasibility Study. The second public comment period resulted in over 250 comments regarding the two newly highlighted issues and the Feasibility Study generally. One local government department fully supported the alternative recommended in July of 1983. Numerous comments addressed the technical rationale as well as the legal basis for U.S. EPA's recommended alternative. Many of the comments received raised similar issues. Therefore, U.S. EPA responds to these comments categorically. Generally stated the comments focused upon 1) the appropriateness and extent of removal of PCB-contaminated materials and 2) technical considerations and 3) soils-economic effects on the community.

Comment

A number of commentators (local government, public interest groups, residents, businesses & boatowners) found the contain-

ment cells, particularly that to be built in Slip No. 3, unacceptable. One of the primary concerns was that PCB-containing materials would remain in the Waukegan area. Second, concern was expressed that the potential for leakage from the containment cells existed. Third, many commentators were concerned with the effect of a containment cell in the Harbor on the local marina, the Waukegan tax base and the recreational use of the harbor.

Response:

The Agency agrees with commentators that due to problems of reliability associated with containment cells built in proximity to Lake Michigan, containment is considered less reliable than offsite transport and disposal of the PCB contaminated material at a chemical landfill as defined by the PCB regulations.

The U.S. EPA has consistently held that the public health risks associated with PCBs, particularly high concentrations of PCBs, are such that the release of PCBs into the environment must be strictly controlled. The U.S. EPA has concluded that the excavation and offsite disposal option would be the appropriate remedial action for the OMC site if Fund-balancing considerations were not taken into account.

Because of the very high cost of off-site disposal, however, the Agency tried to develop a balanced combination of options that

takes into account the less reliability of onsite containment cells yet minimizes the very expensive offsite transport and disposal. Accordingly, the option chosen for implementation includes both offsite disposal and onsite containment components. Additionally, the chosen remedial action includes extensive post closure monitoring of the containment cells to ensure their continued integrity and as a result of public comment, an internal drainage system will be installed. This internal drainage system can be used to create a negative water pressure within the cells, and thus cause water to flow into the cell instead of out of the cell should the walls begin to leak. The chosen alternative will result in the offsite removal of the most heavily contaminated materials. Approximately 92 percent of all the PCBs now found in Slip No. 3 and the Upper Harbor, and 57 percent of all of the PCBs now found in the North Ditch Parking Lot area will be removed and disposed of at a licensed chemical waste landfill.

Comment:

One public interest group commented that the use of the harbor for containment would be unacceptable as the area geology is unsuitable. Specifically, the underlying till, the close proximity of surface water and shoreland to the recommended containment cell and the high groundwater table were noted as physical impediments to the feasibility of a containment cell.

Response:

The Agency believes that the geologic conditions are acceptable for the use of Slip #3 as a containment cell. Geological studies of the area have been performed and were considered during the evaluation of alternative solutions. The harbor sediments consist of 1 to 7 feet of very soft organic silt overlying typically 4 feet of medium dense, fine to coarse sand. A very fine silt (glacial till) that typically ranges from 50 to more than 100 feet underlies the sand. This till layer is impermeable and should prevent the downward migration of PCBs. The total thickness of the clay more than compensates for any irregularities (such as sand lenses) that may occur within the strata. Additionally, the Agency disagrees that the observed penetration of PCBs into the till layer at the OMC outfalls in Slip No. 3 and in the Crescent Ditch are dispositive of glacial till being an inadequate containing layer. This issue is discussed in the Feasibility Study at page 6-78. It appears that penetration occurred in these areas because nearly pure PCB fluids were moving in the interstitial pore spaces in the soil. The higher specific gravity of the PCB compound. (1.38 for Aroclor 1242) caused it to flow downward, displacing pore water. Where PCB concentrations are lower, the PCBs are probably adsorbed onto soil particles and/or reduced in mobility by capillary forces in pore spaces. This hypothesis is suggested by the fact that PCB penetration into the till has not been

observed elsewhere on the site. Variability in till deposits is also expected, resulting in spatially varying permeabilities. Glacial till has a relatively low permeability. It is not anticipated that substances could migrate more than 20 to 30 feet in 120 years.

Comment:

A number of commentators (local government, citizen group and residents) indicated that a temporary storage of the PCBS should be considered. This temporary storage could occur either under the recommended containment cells alternative or by altering the proposals to include temporary aboveground storage.

Response:

As indicated during the public meeting held on August 3, 1983, U.S. EPA will continue to pursue the possibility of innovative technological methods regarding destruction of PCBs. Should a cost-effective method of destroying PCBs be proven during the pendency of the OMC site remedial action, the Agency may reconsider the current containment cell proposal. The public will be notified of any possible alterations to the remedial action.

Comment:

Two local businesses indicated that the party responsible for long-term operation and maintenance of the site was not identified.

Response:

Pursuant to Section 104(c)(3)(A)(c), 42 U.S.C. 9604(c)(3)(A)(c), the State of Illinois will provide the appropriate assurances for all future maintenance of the remedial action for the expected life of the action and assure payment of all future maintenance.

Comment:

Public interest groups, residents and citizen generally commented that the Agency should consider incineration (one commentator specifically mentioned a multiple-hearth incinerator) as the appropriate remedial alternative.

EPA agrees that the multiple-hearth incinerator would likely be the method of choice for the OMC site, if incineration were to be chosen. A review of various available PCB destruction systems made during the preliminary screening indicated that incineration offered the only potentially available, feasible means of PCB destruction for the contaminated sediment and soil at Waukegan. Cost were estimated to be on the order of \$500 to \$1,000 per cubic yard of contaminated sediment and soil (See Feasibility Study, p. 4-10). The PCBs must be delivered in 15- or 30-gallon drums. The cost of incineration typically varies from \$60 to \$80 per drum regardless of the drum size. This equates to a cost of \$425 to \$575 per cubic yard, assuming 30-gallon drums 95 percent full. The drums themselves will cost about \$22 each (ICC-approved for interstate transportation of hazardous waste), equating to

about \$150 per cubic yard for drums. Transportation costs must be additionally added, dependent upon the location of the incinerator.

For comparison purposes only, a rough estimate of the cost of incineration of all PCBs and PCB-contaminated sediment and soil at the OMC site was made based on the Feasibility Study cost estimates for excavation and disposal alternatives (Slip No. 3 Alternatives 2D, Upper Harbor Alternative 2B, North Ditch/Parking Lot Alternative 1). The estimated cost of complete excavation and disposal in a PCB landfill of all sediment and soil with PCB concentrations in excess of 50 ppm was about \$64 million. A cost of \$50 per cubic yard for transportation and disposal was used to develop this estimate. Thus, the total transportation and disposal cost for 260,000 cubic yards of contaminated material (including dewatering lagoon lining and volatilization control material) would be about \$13 million. The cost for incineration of 260,000 cubic yards of material would range from about \$130 to \$260 million (using a range of \$500 to \$1,000 per cubic yard). Adding this to the cost for excavation and related activities gives a total of \$170 to \$300 million for excavation and incineration of sediment and soil with PCB concentrations of 50 ppm or more.

Onsite incineration would reduce transportation costs, but would increase incineration costs by increasing the capital

recovery cost per ton incinerated (unless the incinerator became a permanent disposal facility). Offsite incineration would be expected to raise transportation costs while lowering incineration costs. Since this is an order of magnitude greater than the onsite containment alternatives, it was eliminated from further consideration.

At an incinerator with a capacity of about 20,000 gallons per day, it would take over 6 years to destroy all OMC sediment and soil with PCB concentration of 50 ppm or greater. This assumes that the incinerator is operated 7 days a week, accepting no other waste, and experiencing no down time. Destroying the OMC soils with concentrations of 10 to 50 ppm under the same assumptions would take nearly 3 1/2 years.

Comment:

Two public interest groups expressed concern that the silt curtain contemplated by the recommended Action 2 would not be sufficient to prevent further contamination to the Waukegan Harbor during the dredging of the Upper Harbor. Similarly, one citizen expressed concern that any disturbance of PCB-contaminated sediments should be prevented.

Response:

Although the Agency is no longer contemplating the Slip No. 3 and Upper Harbor containment cell as originally recommended,

the selected alternative includes the dredging of the Slip and Upper Harbor. The Agency agrees with the commentators that all precautions should be taken to minimize possible sediment dispersion during the dredging process. The silt curtains can be constructed of modern, small-equivalent-opening size geotextile, weighted to contact the harbor bottom or keyed into the muck layer. They can be located away from the immediate vicinity of the dredge to reduce the chances of damage from dredging. Fine sediments (.01 mm equivalent diameter--near the middle of the silt-clay range) would be expected to stay in suspension for one or more days in perfectly still water 10 feet deep. The settling time will increase in disturbed water. U.S. EPA believes that the three methods identified in the feasibility study will ensure that sediment dispersion will be kept to a minimum. First, the use of a hydraulic dredge and the proper dredge head should minimize roiling and sediment dispersion. Second, a sediment dispersal control system will also be employed to minimize migration of PCB-containing sediments beyond the dredging area. Either a double silt curtain or steel sheet piling will be used. Third, a monitoring and contingency notification plan with the Waukegan Water Supply Authority will be established.

The Agency believes these methods represent the most effective way of minimizing (or preventing) the PCB-containing sediment movement during the remedial dredging process.

Comment:

A number of commentators (residents, affected businesses and boat owners) indicated that should U.S. EPA build a containment cell in Slip No. 3 and the Upper Harbor, changes in wave action or surging could develop in the Waukegan Harbor which would negatively impact the ability to use the Harbor for commercial and recreational purposes.

Response:

As the alternative selected for the Slip and Upper Harbor contaminated sediments no longer includes the construction of a containment cell in the water, the comment is no longer applicable.

Comment:

One commentator (a government agency) asked for additional information regarding the effects of the alternatives upon Waukegan Harbor phytoplankton, zooplankton, benthic macroinvertebrates and fish.

Response:

Any dredging alternative which would result in the removal of contaminated harbor sediment would have a beneficial impact on phytoplankton, zooplankton, macroinvertebrates or fish that would inhabit or spend a short period of time in Slip No.3 or the Waukegan Harbor. The macroinvertebrates form the basis of the

food chain. They also represent the first step in bioaccumulation of PCBs in the food chain. The Agency believes that a project which would control PCB input into the food chain would benefit all trophic levels, including humans.

Since 1978, U.S. EPA has conducted numerous sampling studies concerning the Waukegan Harbor sediments. Although these studies were not directly aimed at describing the benthic communities, they do provide some insight into the nature of bottom biological communities. Based upon core data and ponar dredge samples of the surficial sediments, the sediment is essentially void of macrobenthic organisms. Extensive coring of Slip No. 3 and the Upper Harbor has surfaced the presence of a few blood worms and empty clam shells. One piece of filamentous blue-green algae was noted during the ponar dredge sampling of April, 1983. The Harbor supports no fish spawning or nursery areas.

Comment:

Three commentators (resident, local government entity and local business) commented that no evidence exists to substantiate claims that PCBs in Waukegan Harbor are a danger to public health. A number of other residents commented that PCBs in Waukegan Harbor pose a substantial threat to their health and welfare.

Response:

The U.S. EPA Ambient Water Quality Criteria for protection of freshwater aquatic life from PCB chronic toxicity is 0.014 parts per billion (ppb). The total PCB concentrations in the surface water at the OMC site vary from about 0.6 ppb in Waukegan Harbor to less than 0.01 ppb in Lake Michigan directly offshore from Waukegan Harbor. Although the magnitude of PCB effects on human health are not yet known, U.S. EPA Ambient Water Quality Criteria for carcinogenicity protection of human health from ingestion of water and organisms is 0.00079 ppb at the 10^{-5} risk level. Concentrations that have a risk level of 10^{-5} are estimated to result in an increase of one cancer death per 100,000 people who experience PCB exposure over a lifetime. Additional documentation regarding the effects of PCBs on human health are identified in the Chapter 8 of the Feasibility Study and are available for review during normal business hours at the Region V offices. None of the commentators provided any support to their comments regarding the health effects of PCBs in Waukegan Harbor. U.S. EPA is, therefore, unable to address these comments with any more specificity.

Comment:

A number of commentators (local government, citizen groups and residents) commented that emerging technologies for PCB extraction and destruction were not adequately evaluated.

Response:

A comprehensive search for emerging technologies was conducted by the Agency. A number of these were evaluated by Agency. See Feasibility Study, pages 2-11 through 2-15. Current information available to the Agency indicates that none of the emerging technologies have become established technologies of proven applicable to the OMC site. The Agency believes that timing is critical in the cleanup of the Waukegan Harbor in order to mitigate and minimize further migration of contamination in the Harbor area. Although the Agency fully supports the development of emerging technologies, the benefit of these technologies must be weighed against the need to begin a remedial action in a timely manner. Pursuant to the NCP, a detailed analysis of the alternatives must include an emphasis on the use of established technology. 40 C.F.R. Part 300.68(i)(2)(A).

Comment:

One citizen group commented that the future operation and maintenance costs of containment cells outweighs the initial cost benefits of this type of solution.

Response:

The NCP requires that during the initial screening of alternatives, the Agency must consider both the cost of implementing the remedial action and all operation and maintenance costs. 40

C.F.R. Part 300.68(h)(1). Additionally, during the detailed analysis of alternatives, U.S. EPA must include (as a criteria for further alternative examination) the distribution of costs over time. 40 C.F.R. Part 300.68(i)(B). The detailed cost estimates contained in Chapter 5 of the Feasibility Study include an estimation of operation and maintenance costs in present worth dollars. The operation and maintenance costs for the selected remedial plan have been estimated at \$800,000. Upon an examination of the other alternatives reviewed in the Feasibility Study, U.S. EPA has determined that the operation and maintenance costs attributable to the recommended alternative do not adversely affect its cost effectiveness.

Comment:

One public interest group indicated that proper transportation precautions must be used in any offsite removal.

Response:

U.S. EPA agrees. Any offsite removal of contaminated materials will be performed in accordance with the Resource, Conservation and Recovery Act and the regulations promulgated thereunder.

Comment:

One resident commented that a no action alternative was the appropriate remedial action at this site.

the containment cells. As a result of the comment, however, the Agency has reevaluated this position for North Ditch/Parking Lot area. The Agency has evaluated the costs for the installation of an internal drainage system and believes that since future leakage cannot be ruled out, it is more effective to install a system in North Ditch prior to the completion of the recommended alternative, than to install such a system at a later date. The North Ditch area would each be provided with a network of monitoring wells inside the confined slurry walls. Should it be subsequently necessary, a pumping system will be installed. To maintain a positive flow into the containment cell, water would be pumped from this system to maintain a water level inside the cell about two feet lower than the watertable outside the slurry walls. Water thus removed would receive granular activated carbon treatment to remove the PCBs.

Comment:

One citizen group commented that landfill alternatives are not permanent disposal options in the sense that the problem still exists, although it is more efficiently contained. The commentator indicated that it is therefore, inappropriate to compare landfill alternatives to actual destruction technology alternatives without an adjustment for long term maintenance costs associated with landfill.

Response:

U.S. EPA agrees that treatment, destruction and detoxification are preferred alternatives to land disposal of hazardous or toxic wastes. For many years, U.S. EPA has been encouraging the development of alternative methods of waste disposal. It has become evident that adequate alternative storage capacity does not currently exist to manage all the waste now land disposed. While no method of hazardous waste management is failproof, rules concerning landfilling are designed to protect human health and the environment. Land disposal is a proven technology which will be necessary for the foreseeable future. Current stringent oversight, as provided by the regulations, will help assure the security of landfills to the greatest extent possible.